Table 1 Quarterly Residential Well Sampling Project Parker County, TX

Third Quaterly Sampling Event - November/December 2012 Summary of Samples Collected

Water Well Number (WW#)	Property Owner	Sample Collection Date	Water Condition	Sample Field Identification	Accutest Laboratory Package/Sample Identification #	Comments
WW1	Rodney and Geraldine Wells	11/30/2012	Un-treated	WW1-WEL-113012	TC20872	
WW2	Michelle Perdue	11/30/2012	Un-treated	WW2-Pur-113012	TC20890	Volume for MS/MSD collected (Accutest)
WW6	Amanda M. Thompson	12/1/2012	Un-treated	WW6-Tho-120112	TC20878	
WW7	Jeff W. Merryman	11/30/2012	Un-treated	WW7-Mer-113012	TC20871	
WW10	Devyn Hayley	12/2/2012	Un-treated	WW10-Hay-120212	TC20882	Collected at tank inlet; therefore, sample for analysis at Isotech cannot be collected
WW11	Harry and Margaret Anderson	12/1/2012	Un-treated	WW11-And-120112	TC20874	
WW13	Tom Struths	12/2/2012	Un-treated	WW13-Str-120212	TC20886	
WW14A	Stephen and Carol Hurst	12/2/2012	Un-treated	WW14A-Hur-120212	TC20883	
WW15	Stephen and Carol Hurst	12/2/2012	Un-treated	WW15-Hur-120212	TC20887	
WW18	Thomas and Elizabeth Struths	12/2/2012	Un-treated	WW18-Str-120212	TC20885	Collected at tank inlet; therefore, sample for analysis at Isotech cannot be collected
WW19	Joseph and Rebecca Williams	12/1/2012	Un-treated	WW19-Wil-120112	TC20877	
WW20	Dennis Huffman	12/1/2012	Un-treated	WW20-Huf-120112 Dup-120112	TC20875 TC20873	Purged well through sprinklers at Mr. Huffman's request Duplicate collected (Accutest)
WW21	Kirk and Brenda VanNewkrik	11/30/2012	Treated	WW21-Van-113012	TC20879	
WW22	Timothy and Sheryl Simpson	12/1/2012	Un-treated	WW-22-Sim-120112	TC20876	Found spigot broken; could not connect garden hose. Used 3/8" tubing inserted into spigot opening.
WW24	Pamela Smith	11/30/2012	Un-treated	WW24-Smi-113012	TC20880	
WW25	Jeff Matthews	12/2/2012	Un-treated	WW25-Mat-120212	TC20881	
	Trip Blank	12/2/2012		TB1-1202-12		
	Equipment Blank	12/2/2012		EB1-120212	TC20889	
	Equipment Blank	12/2/2012		EB2-120212		
	Trip Blank	12/2/2012		TB2-120212	TC20888	





Technical Report for

EarthCon Consultants

Quarterly Well Sampling, Parker County, Texas

3rd Quarter / WW11-And

Accutest Job Number: TC20874

Sampling Date: 12/01/12



EarthCon Consultants 4800 Sugar Grove Suite 420

Stafford, TX 77477

gfloreslovo@earthcon.com; djackson@jacksonsjoberg.com; mcpatton@rangeresources.com; escott@earthcon.com

ATTN: Gabriela Floreslovo

Total number of pages in report: 27



Test results contained within this data package meet the requirements of the National Environmental Laboratory Accreditation Conference and/or state specific certification programs as applicable.

Client Service contact: Elessa Sommers 713-271-4700

Certifications: TX (T104704220-12-8) AR (11-028-0) AZ (AZ0769) FL (E87628) KS (E-10366) LA (85695/04004) OK (211-035)

This report shall not be reproduced, except in its entirety, without the written approval of Accutest Laboratories. Test results relate only to samples analyzed.

Richard Rodriguez

Laboratory Director





10165 Harwin Drive Houston, TX 77036 Tel: 713-271-4700

www.accutest.com

Friday, December 28, 2012

EarthCon Consultants 4800 Sugar Grove, Suite 420 Stafford, TX 77477 ATTN: Gabriela Floreslovo

RE: Accutest job TC20874 Reissue

Dear Ms. Floreslovo:

The final report for job number TC20874 has been revised to add a "U" flag to the Ethane result

I apologize for any inconvenience. Please feel free to contact me if I can be of further assistance.

Sincerely,

Elessa Sommers

Elessa Sommers Project Manager



Sections:

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-1-

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Sample Summary

EarthCon Consultants

Job No: TC20874

Quarterly Well Sampling, Parker County, Texas Project No: 3rd Quarter / WW11-And

Sample	Collected	l		Matrix	Client
Number	Date	Time By	Received	Code Type	Sample ID
TC20874-1	12/01/12	08:23	12/04/12	AQ Ground Water	WW11-AND-120112





SAMPLE DELIVERY GROUP CASE NARRATIVE

Client: EarthCon Consultants Job No TC20874

Site: Quarterly Well Sampling, Parker County, Texas Report Date 12/12/2012 12:04:55 P

1 Sample was collected on 12/01/2012 and received intact at Accutest on 12/04/2012 and properly preserved in 1 cooler at 2.4 Deg C. The sample received an Accutest job number of TC20874. A listing of the Laboratory Sample ID, Client Sample ID and date of collection are presented in the Results Summary Section of this report.

Except as noted below, all method specified calibrations and quality control performance criteria were met for this job. For more information, please refer to QC summary pages.

Volatiles by GCMS By Method SW846 8260B

Matrix AQ Batch ID: VX1673

- All samples were analyzed within the recommended method holding time.
- All method blanks for this batch meet method specific criteria.
- Sample(s) TC20864-1MS, TC20864-1MSD were used as the QC samples indicated.

Volatiles by GC By Method RSKSOP-147/175

Matrix AQ Batch ID: GSS232

- All samples were analyzed within the recommended method holding time.
- All method blanks for this batch meet method specific criteria.
- Sample(s) TC20890-1DUP, TC20890-1MS were used as the QC samples indicated.
- Matrix Spike Recovery(s) for Ethene, Propane are outside control limits. Probable cause due to matrix interference.
- Matrix Spike Recovery(s) for Ethane, Methane are outside control limits. Outside control limits due to high level in sample relative to spike amount.
- RPD(s) for Duplicate for Butane, Isobutane, Propane are outside control limits for sample TC20890-1DUP.

Accutest Laboratories Gulf Coast (ALGC) certifies that this report meets the project requirements for analytical data produced for the samples as received at ALGC and as stated on the COC. ALGC certifies that the data meets the Data QualityObjectives for precision, accuracy and completeness as specified in the ALGC Quality Manual except as noted above. This report is to be used in its entirety. ALGC is not responsible for any assumptions of data quality if partial data packages are used



Summary of Hits Job Number: TC20874

Account: EarthCon Consultants

Project: Quarterly Well Sampling, Parker County, Texas

Collected: 12/01/12

Lab Sample ID Analyte	Client Sample ID	Result/ Qual	MQL	SDL	Units	Method
TC20874-1	WW11-AND-1201	12				
Methane		0.0109	0.00050	0.00030	mg/l	RSKSOP-147/175



Sample Results	
Report of Analysis	



Report of Analysis

Client Sample ID: WW11-AND-120112

 Lab Sample ID:
 TC20874-1
 Date Sampled:
 12/01/12

 Matrix:
 AQ - Ground Water
 Date Received:
 12/04/12

 Method:
 SW846 8260B
 Percent Solids:
 n/a

Project: Quarterly Well Sampling, Parker County, Texas

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	X0087071.D	1	12/06/12	CF	n/a	n/a	VX1673
Run #2							

	Purge Volume	
Run #1	5.0 ml	
Run #2		

Purgeable Aromatics

CAS No.	Compound	Result	MQL	SDL	Units	Q
71-43-2 108-88-3 100-41-4 1330-20-7	Benzene Toluene Ethylbenzene Xylene (total)	0.00034 U 0.00033 U 0.00032 U 0.00087 U	0.0010 0.0010 0.0010 0.0030	0.00034 0.00033 0.00032 0.00087	mg/l mg/l mg/l mg/l	
CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits		
1868-53-7 17060-07-0 2037-26-5 460-00-4	Dibromofluoromethane 1,2-Dichloroethane-D4 Toluene-D8 4-Bromofluorobenzene	106% 95% 100% 96%		72-122% 68-124% 80-119% 72-126%		

 $\begin{array}{ll} U = & Not \; detected & SDL \; - \; Sample \; Detection \; Limit \\ MQL = & Method \; Quantitation \; Limit \\ \end{array}$

E = Indicates value exceeds calibration range

J = Indicates an estimated value

B = Indicates analyte found in associated method blank N = Indicates presumptive evidence of a compound



4

Report of Analysis

Client Sample ID: WW11-AND-120112

 Lab Sample ID:
 TC20874-1
 Date Sampled:
 12/01/12

 Matrix:
 AQ - Ground Water
 Date Received:
 12/04/12

 Method:
 RSKSOP-147/175
 Percent Solids:
 n/a

Project: Quarterly Well Sampling, Parker County, Texas

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch	
Run #1	SS005044.D	1	12/06/12	LT	n/a	n/a	GSS232	
Run #2								

RSK147 Special List

CAS No.	Compound	Result	MQL	SDL	Units	Q
74-82-8	Methane	0.0109	0.00050	0.00030	mg/l	
74-85-1	Ethene	0.00050 U	0.0010	0.00050	mg/l	
74-84-0	Ethane	0.00050 U	0.0010	0.00050	mg/l	
74-98-6	Propane	0.00075 U	0.0015	0.00075	mg/l	
75-28-5	Isobutane	0.00075 U	0.0015	0.00075	mg/l	
106-97-8	Butane	0.00075 U	0.0015	0.00075	mg/l	

 $\begin{array}{ll} U = & Not \; detected & SDL \; - \; Sample \; Detection \; Limit \\ MQL = & Method \; Quantitation \; Limit \\ \end{array}$

E = Indicates value exceeds calibration range

J = Indicates an estimated value

B = Indicates analyte found in associated method blank N = Indicates presumptive evidence of a compound





Misc. Forms

Custody Documents and Other Forms

Includes the following where applicable:

- · Chain of Custody
- LRC Form



CHAIN OF CUSTODY

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Stafford TX 77477 Project Contact E-mail	Project #														별			1		1					SO - Soil SL- Sludge
Gabriela Floreslovo	Project #			Street A	ddress									1	so					ļ					SED-Sediment
Phone # Fax #	0													1	, o			1				1			OI - Oil LIQ - Other Liquid
281-201-3513	Client Purchase	Order#		City					State			Zip)	1	le 2	,									AIR - Air
Sampler(s) Name(s) Phone #	Project Manager													Į.	12 8	-									SOL - Other Solid WP - Wipe
JB SH, RM	Project Manager	r		Attention	1:									1	Ethane, Ethe					1	1				FB-Field Blank
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Intact
Not intact

Date Time:

TC20874: Chain of Custody Page 1 of 4







Accutest Laboratories Sample Receipt Summary

Accutest Job Number: TO	С	lient: EARTHC	O CONS	ULTANTS	;	Project:	3RD QTR WEL	L SAMPLIN	NG,PARKE	R COUNTY,T		
Date / Time Received: 12	2/4/2012		Delivery	Method	:	Client	Airbill #'s:					
No. Coolers: 1	Ther	m ID: IR6	3				tment Factor:	0.2				
Cooler Temps (Initial/Adjusted): #1: (2.2/2.4)												
Cooler Security	Y or N	<u>L</u>		Υ ο	or N	Sample Integ	rity - Docume	ntation	Υ	or N		
1. Custody Seals Present:	✓ [] 3. 0	COC Present:	✓		Sample labe	els present on bo	ttles:	✓			
2. Custody Seals Intact:	✓ [] 4. Smp	ol Dates/Time OK	\checkmark			beling complete:		✓			
Cooler Temperature	Υ	or N				3. Sample con	tainer label / CO	C agree:	~			
Temp criteria achieved:	<u> </u>					Sample Inter	grity - Conditio	on	ΥΥ	or N		
2. Cooler temp verification:	Inf	fared Gun				1. Sample recv			~			
3. Cooler media:	lo	ce (bag)					rs accounted for:		✓			
Quality Control Preservat	ion Y	or N	N/A	WTB	STB	3. Condition of	sample:			Intact		
1. Trip Blank present / cooler:				✓		Sample Inter	grity - Instruct	ions	Y	or N	N/A	
2. Trip Blank listed on COC:		\checkmark					quested is clear:		<u> </u>	П		
3. Samples preserved proper	ly: 🔽					,	eived for unspeci			✓		
4. VOCs headspace free:	✓	П				3. Sufficient vo	olume recvd for a	analysis:	<u> </u>			
·	_	_					g instructions cle				\checkmark	
						5. Filtering ins	structions clear:				V	
Comments -Received trip bla	ank not list	ed on COC										

TC20874: Chain of Custody Page 2 of 4

Page 1 of 3







Problem Resolution

Accutest Job Number: TC20874

CSR: Elessa Sommers Response Date: 12/4/2012

Response: Trip blank is on separate report.

__

TC20874: Chain of Custody Page 3 of 4







Sample Receipt Log

 Job #:
 TC20874
 Date / Time Received:
 12/4/2012 9:22:00 AM
 Initials:
 CH

Client: EARTHCO CONSULTANTS

Cooler #	Sample ID:	Vol	Bot #	Location	Pres	Pres pH		Initial Temp	Therm CF	Corrected Temp
1	TC20874-1	40ml	1	VR	HCL	Note #1 - Preservative to be checked by analyst at the instrument.	IR6	2.2	0.2	2.4
1	TC20874-1	40ml	2	VR	HCL	Note #1 - Preservative to be checked by analyst at the instrument.	IR6	2.2	0.2	2.4
1	TC20874-1	40ml	3	VR	HCL	Note #1 - Preservative to be checked by analyst at the instrument.	IR6	2.2	0.2	2.4
1	TC20874-1	40ml	4	VR	HCL	Note #1 - Preservative to be checked by analyst at the instrument.	IR6	2.2	0.2	2.4
1	TC20874-1	40ml	5	VR	HCL	Note #1 - Preservative to be checked by analyst at the instrument.	IR6	2.2	0.2	2.4
1	TC20874-1	40ml	6	VR	HCL	Note #1 - Preservative to be checked by analyst at the instrument.	IR6	2.2	0.2	2.4

TC20874: Chain of Custody

Page 4 of 4



Laboratory Data Package Cover Page Appendix A

This signature page, the laboratory review checklist, and the following reportable data:

TC20874 This data package consists of

[]

Richard Rodriguez

₽	R1	Field chain-of-custody documentation	n;	
Ģ	R2	Sample identification cross-reference	;	
	R3	Test reports (analytical data sheets) f	for each environmental sample that includes:	
		a)	Items consistent with NELAC 5.13 or ISO/IEO	C 17025 Section 5.10
		b)	dilution factors,	
		c)	preparation methods,	
		d)	cleanup methods, and	
		e)	if required for the project, tentatively identified	d compounds (TICs).
	R4	Surrogate recovery data including:		
		a)	Calculated recovery (%R), and	
		b)	The laboratory's surrogate QC limits.	
	R5	Test reports/summary forms for blank	k samples;	
	R6	Test reports/summary forms for labor	ratory control samples (LCSs) including:	
		a)	LCS spiking amounts,	
		b)	Calculated %R for each analyte, and	
		c)	The laboratory's LCS QC limits.	
₽	R7	Test reports for project matrix spike/n	natrix spike duplicates (MS/MSDs) including:	
		a)	Samples associated with the MS/MSD clearly	y identified,
		b)	MS/MSD spiking amounts,	
		c)	Concentration of each MS/MSD analyte mea	sured in the parent and
		d)	Calculated %Rs and relative percent differen	ces (RPDs), and
		e)	The laboratory's MS/MSD QC limits	
₽	R8	Laboratory analytical duplicate (if app	olicable) recovery and precision:	
		a)	The amount of analyte measured in the dupli	cate,
		b)	The calculated RPD, and	
		c)	The laboratory's QC limits for analytical dupli	icates.
₽	R9	List of method quantitation limits (MC	Ls) and detectability check sample results for	each analyte for each
	R10	Other problems or anomalies.		
The Excep	tion Report	for each "No" or "Not Reviewed (NR)"	item in Laboratory Review Checklist and for e	ach analyte, matrix, and
method for	r which the I	aboratory does not hold NELAC accre	editation under the Texas Laboratory Accredita	tion Program.
Release S	Statement:	I am responsible for the release of this	s laboratory data package. This laboratory is N	NELAC accredited under the
			, analytes, and matrices reported in this data p	
		•	by the laboratory and is complete and technic	
			ne laboratory in the attached exception reports	
			observed by the laboratory as having the pote	, , ,
			atory Review Checklist, and no information or	
withheld.	iavo boomia	critined by the laboratory in the Labora	atory review emocialist, and no information of	data nave been knowingly
with in lold.				
Check if	annlicable:	This laboratory meets an exception u	nder 30 TAC&25.6 and was last inspection by	,
[]	аррисавіс.	•	· · ·	
1.1			011. Any findings affecting the data in this lab	
			n. The official signing the cover page of the re	
			data package and is by signature affirming th	e above release statement
		is true.		
QA Mana	_	-		
Name (Pri	nted)	Signature	Official Title (printed)	Date

Laboratory Director

Date 12/12/2012



	L	ABORATORY REVIEW CHECKLIST: REPORTABLE	DAT	Ά			
Laboratory	/ Name:	Accutest Gulf Coast LRC Date:	12/	/12/2	012		
		Quarterly Well Sampling, Parker					
Project Na		County, Texas Laboratory Project Number:	TC20874				
Reviewer	Name:	Anita Patel Prep Batch Number(s):	GSS				
#1	A²	DESCRIPTION	YES	NO	NA°	NR⁴	ER #5
R1	OI	CHAIN-OF-CUSTODY (C-O-C):					
		Did samples meet the laboratory's standard conditions of sample acceptability	X				İ
		upon receipt?	X				-
		Were all departures from standard conditions described in an exception report?	 ^				
R2	OI	Sample and quality control (QC) identification	- V				
		Are all field sample ID numbers cross-referenced to the laboratory ID numbers?	X				
		Are all laboratory ID numbers cross-referenced to the corresponding QC data?	X				
R3	OI	Test reports					
		Were samples prepared and analyzed within holding times?	X				<u> </u>
		Other than those results <mql, all="" bracketed="" by="" calibration<="" other="" raw="" td="" values="" were=""><td>Х</td><td></td><td></td><td></td><td>İ</td></mql,>	Х				İ
		standards? Were calculations checked by a peer or supervisor?	X				-
		Were all analyte identifications checked by a peer or supervisor?	X				
		Were sample detection limits reported for all analytes not detected?	T X				
		Were all results for soil and sediment samples reported on a dry weight basis?	+		Х		
		Were % moisture (or solids) reported for all soil and sediment samples?	+		X		
		Were bulk soils/solids samples for volatile analysis extracted with methanol per	†				
		SW846 Method 5035?			Х		İ
	If required for the project, are TIC's reported?				Χ		
R4	0	Surrogate recovery data					
		Were surrogates added prior to extraction?	Х				
		Were surrogate percent recoveries in all samples within the laboratory QC limits?	X				<u> </u>
R5	OI	Test reports/summary forms for blank samples					
		Were appropriate type(s) of blanks analyzed?	X				
		Were blanks analyzed at the appropriate frequency?	X				
	Were method blanks taken through the entire analytical process, including preparation and, if applicable, cleanup procedures? Were blank concentrations <mql?< td=""><td>X</td><td></td><td></td><td></td><td>İ</td></mql?<>		X				İ
			X				-
R6	OI	Laboratory control samples (LCS):	 ^				
-10	 0.	Were all COCs included in the LCS?	Х				
		Was each LCS taken through the entire analytical procedure, including prep and					
		cleanup steps?	X				İ
		Were LCSs analyzed at required frequency?	Х				
		Were LCS (and LCSD, if applicable) %Rs within the laboratory QC limits?	Х				
		Does the detectablility check sample data document the laboratory's capability to	Х				_
		detect the COCs at the MDL used to calculate the SDLs?					5
		Was the LCSD RPD within QC limits?			Χ		
R7	OI	Matrix spike (MS) and matrix spike duplicate (MSD) data					
		Were the project/method specified analytes included in the MS and MSD?	X				<u> </u>
		Were MS/MSD analyzed at the appropriate frequency?	X	L.			
		Were MS (and MSD, if applicable) %Rs within the laboratory QC Limits?	 	Х			4
		Were the MS/MSD RPDs within laboratory QC limits?	X				
R8	OI	Analytical duplicate data	-				
		Were appropriate analytical duplicates analyzed for each matrix?	X				
		Were analytical duplicates analyzed at the appropriate frequency?	X	-			4
R9	Were RPDs or relative standard deviations within the laboratory QC limits? R9 OI Method quantitation limits (MQLs):			Х			4
1.3	OI	Are the MQLs for each method analyte included in the laboratory data package?	X				
		Do the MQLs correspond to the concentration of the lowest non-zero calibration	^	\vdash			
		Are unadjusted MQLs and DCSs included in the laboratory data package?	^ X 2				
R10	OI	Other problems/anomalies					
	<u> </u>	Are all known problems/anomalies/special conditions noted in this LRC and ER?	Х				
		Was applicable and available technology used to lower the SDL to minimize the	X				
		Is the laboratory NELAC-accredited under the Texas Laboratory Accreditation					
		Program for the analytes, matrices, and methods associated with this laboratory	X				3
		data package?					<u> </u>
					_		



Laboratory Name:		Accutest Gulf Coast LRC Date:					12/12/2012			
Project Na	me:	Quarterly Well Sampling, Parker Laboratory Project Number:		TC	TC20874					
Reviewer	Name:	Anita Patel Prep Batch Number(s):			GSS232, VX1673					
#1	A ²	DESCRIPTION		YES	NO	NA^3	NR⁴	ER#5		
S1	OI	Initial calibration (ICAL)								
		· ·	e response factors for each analyte within QC	l _x l						
		limits?								
			Vere percent RSDs or correlation coefficient criteria met?							
			mended in the method used for all analytes?	Х						
			ne lowest and highest standard used to	x						
		calculate the curve?								
		Are ICAL data available for all instrum		Х						
		standard?	verified using an appropriate second source	X						
S2	OI		prification (ICCV AND CCV) and continuing							
- 32	<u> </u>		nitial and continuing calibration verification (ICCV AND CCV) and continuing Vas the CCV analyzed at the method-required frequency?							
			alyte within the method-required QC limits?	X						
		Was the ICAL curve verified for each		X						
		Vas the absolute value of the analyte concentration in the inorganic CCB <mdl?< th=""><th>Х</th><th></th><th></th></mdl?<>				Х				
S3	0	Mass spectral tuning	, , , , , , , , , , , , , , , , , , , ,							
			Was the appropriate compound for the method used for tuning?							
			Vere ion abundance data within the method-required QC limits?							
S4	0	Internal standards (IS)	· · · · · · · · · · · · · · · · · · ·							
		Were IS area counts and retention times within the method-required QC limits?								
S5	OI	Raw data (NELAC Section 5.5.10)								
		Were the raw data (for example, chromatograms, spectral data) reviewed by an								
		analyst?								
		Were data associated with manual integrations flagged on the raw data?								
S6	0	Dual column confirmation								
		Did dual column confirmation results meet the method-required QC?				Χ				
S7	0	Tentatively identified compounds					-			
			s spectra and TIC data subject to appropriate			Χ				
S8	ı	checks? Interference Check Sample (ICS) r	o o ulto							
30	<u>'</u>	Were percent recoveries within metho				Х				
S9			kes, and method of standard additions			^				
	<u>'</u>		, and the linearity within the QC limits				1			
		specified in the method?	, and the initiality want the Go initial			Χ				
S10	OI	Method detection limit (MDL) studi	es							
		Was a MDL study performed for each		Х						
		Is the MDL either adjusted or support	ed by the analysis of DCSs?	Х				5		
S11	OI	Proficiency test reports								
		Was the laboratory's performance ac	ceptable on the applicable proficiency tests or	х						
		evaluation studies?		_ ^						
S12	OI	Standards documentation								
		1	s NIST-traceable or obtained from other	l x l						
		appropriate source?								
S13	OI	Compound/analyte identification p		V						
S14	OI	Are the procedures for compound/and	•	Х						
314	0	Demonstration of analyst compete Was DOC conducted consistent with		Х			1			
		Is documentation of the analyst's com		X			-+			
S15	OI	·	ion for methods (NELAC Chapter 5)							
313			the data documentated, verified, and				1			
		validated, where applicable?	and documentated, vermou, and	X						
S16	OI	Laboratory standard operating pro	ocedures (SOPs)							
		Are laboratory SOPs current and on f		Х						
			· · · · · · · · · · · · · · · · · · ·							



	LABOF	RATORY REVIEW CHEC	KLIST (continued): Exception	n Reports					
Laboratory	Name:	Accutest Gulf Coast	LRC Date:	12/12/2012					
Project Na	me:	Quarterly Well Sampling, Parker	Laboratory Project Number:	TC20874					
Reviewer Name: An		Anita Patel	Prep Batch Number(s):	GSS232, VX1673					
ER# ¹	Description	on		•					
	For reporti	ng purposes, the MQL is defined in the	e report as the RL. The unadjusted MQL/RL is	reported in the method					
1		blank. The SDL is defined in the report as the MDL.							
	For reporting purposes, the method blank represents the unadjusted MQL. The DCS is on file in the laboratory and is not								
2	included in	included in the laboratory data package.							
	The laboratory is NELAC-accredited under the Texas Laboratory Accreditation Program for the analytes, matrices, and								
3	methods a	ssociated with this laboratory data pac	kage for analytes that are listed in the Texas F	ields of Accreditation.					
4		ies are discussed in the case narrative							
5		tory does not perform DCS analysis for e values in the Texas TRRP PCL table	or Method RSKSOP-147/175. The component es.	s reported are not listed or					

1ER# = Exception Report identification number (an Exception Report should be completed for an item if "NR" or "No" is checked on





GC/MS Volatiles

QC Data Summaries

Includes the following where applicable:

- Method Blank Summaries
- Blank Spike Summaries
- Matrix Spike and Duplicate Summaries



Method: SW846 8260B

Method Blank Summary Job Number: TC20874

PESTXST EarthCon Consultants **Account:**

Quarterly Well Sampling, Parker County, Texas **Project:**

Sample VX1673-MB	File ID X0087062.D	DF	Analyzed 12/06/12	By CF	Prep Date n/a	Prep Batch n/a	Analytical Batch VX1673

The QC reported here applies to the following samples:

CAS No.	Compound	Result	RL	MDL	Units Q
71-43-2	Benzene	ND	1.0	0.34	ug/l
100-41-4	Ethylbenzene	ND	1.0	0.32	ug/l
108-88-3	Toluene	ND	1.0	0.33	ug/l
1330-20-7	Xylene (total)	ND	3.0	0.87	ug/l

CAS No.	Surrogate Recoveries		Limits
1868-53-7	Dibromofluoromethane	105%	72-122%
17060-07-0	1,2-Dichloroethane-D4	95%	68-124%
2037-26-5	Toluene-D8	99%	80-119%
460-00-4	4-Bromofluorobenzene	98%	72-126%



Method: SW846 8260B

Blank Spike Summary Job Number: TC20874

PESTXST EarthCon Consultants Account:

Quarterly Well Sampling, Parker County, Texas **Project:**

Sample VX1673-BS	File ID X0087060.D	DF 1	Analyzed 12/06/12	By CF	Prep Date n/a	Prep Batch n/a	Analytical Batch VX1673

The QC reported here applies to the following samples:

CAS No.	Compound	Spike ug/l	BSP ug/l	BSP %	Limits
71-43-2	Benzene	25	22.2	89	68-119
100-41-4	Ethylbenzene	25	22.1	88	71-117
108-88-3	Toluene	25	22.4	90	73-119
1330-20-7	Xylene (total)	75	67.7	90	74-119

CAS No.	Surrogate Recoveries	BSP	Limits
17060-07-0	Dibromofluoromethane	101%	72-122%
	1,2-Dichloroethane-D4	99%	68-124%
	Toluene-D8	101%	80-119%
	4-Bromofluorobenzene	92%	72-126%



^{* =} Outside of Control Limits.

6.3.1

Page 1 of 1

Method: SW846 8260B

Matrix Spike/Matrix Spike Duplicate Summary

Job Number: TC20874

Account: PESTXST EarthCon Consultants

Project: Quarterly Well Sampling, Parker County, Texas

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
TC20864-1MS	X0087064.D	1	12/06/12	CF	n/a	n/a	VX1673
TC20864-1MSD	X0087065.D	1	12/06/12	CF	n/a	n/a	VX1673
TC20864-1	X0087063.D	1	12/06/12	CF	n/a	n/a	VX1673

The QC reported here applies to the following samples:

CAS No.	Compound	TC20864-1 ug/l Q	Spike ug/l	MS ug/l	MS %	MSD ug/l	MSD %	RPD	Limits Rec/RPD
71-43-2	Benzene	1.0 U	25	23.0	92	22.4	90	3	68-119/12
100-41-4	Ethylbenzene	1.0 U	25	22.7	91	22.4	90	1	71-117/12
108-88-3	Toluene	1.0 U	25	22.9	92	22.5	90	2	73-119/13
1330-20-7	Xylene (total)	3.0 U	75	69.8	93	68.4	91	2	74-119/13

CAS No.	Surrogate Recoveries	MS	MSD	TC20864-1	Limits
1868-53-7	Dibromofluoromethane	103%	101%	105%	72-122%
17060-07-0	1,2-Dichloroethane-D4	98%	98%	96%	68-124%
2037-26-5	Toluene-D8	100%	100%	100%	80-119%
460-00-4	4-Bromofluorobenzene	91%	92%	98%	72-126%



^{* =} Outside of Control Limits.



GC Volatiles

QC Data Summaries

Includes the following where applicable:

- Method Blank Summaries
- Blank Spike Summaries
- Matrix Spike and Duplicate Summaries



Method: RSKSOP-147/175

Method Blank Summary Job Number: TC20874

Account: PESTXST EarthCon Consultants

Quarterly Well Sampling, Parker County, Texas **Project:**

Sample GSS232-MB	File ID SS005026.D	DF 1	Analyzed 12/06/12	By LT	Prep Date n/a	Prep Batch n/a	Analytical Batch GSS232

The QC reported here applies to the following samples:

CAS No.	Compound	Result	RL	MDL	Units Q
74-82-8	Methane	ND	0.50	0.30	ug/l
74-85-1	Ethene	ND	1.0	0.50	ug/l
74-84-0	Ethane	ND	1.0	0.50	ug/l
74-98-6	Propane	ND	1.5	0.75	ug/l
75-28-5	Isobutane	ND	1.5	0.75	ug/l
106-97-8	Butane	ND	1.5	0.75	ug/l

Method: RSKSOP-147/175

Blank Spike Summary Job Number: TC20874

PESTXST EarthCon Consultants Account:

Quarterly Well Sampling, Parker County, Texas **Project:**

Sample GSS232-BS	File ID SS005023.D	DF 1	Analyzed 12/06/12	By LT	Prep Date n/a	Prep Batch n/a	Analytical Batch GSS232

The QC reported here applies to the following samples:

CAS No.	Compound	Spike ug/l	BSP ug/l	BSP %	Limits
74-82-8	Methane	21.5	21.0	98	68-139
74-85-1	Ethene	57.4	54.7	95	52-145
74-84-0	Ethane	43.3	56.7	131	68-131
74-98-6	Propane	60.6	68.2	113	69-131
75-28-5	Isobutane	72.5	77.3	107	72-131
106-97-8	Butane	76.6	82.4	108	66-128



^{* =} Outside of Control Limits.

Method: RSKSOP-147/175

Matrix Spike Summary

Job Number: TC20874

PESTXST EarthCon Consultants Account:

Quarterly Well Sampling, Parker County, Texas Project:

Sample TC20890-1MS	File ID SS005029.D	DF	Analyzed 12/06/12	By LT	Prep Date n/a	Prep Batch n/a	Analytical Batch GSS232
TC20890-1	SS005027.D	1	12/06/12	LT	n/a	n/a	GSS232
TC20890-1	SS005030.D	250	12/06/12	LT	n/a	n/a	GSS232

The QC reported here applies to the following samples:

CAS No.	Compound	TC20890-1 ug/l Q	Spike ug/l	MS ug/l	MS %	Limits
74-82-8	Methane	20100 b	21.5	17100	-13815	* 6 8-139
74-85-1	Ethene	1.0 U	57.4	5540	9654*	52-145
74-84-0	Ethane	3500 b	43.3	4120	1431*	a 68-131
74-98-6	Propane	66.8	60.6	172	174*	69-131
75-28-5	Isobutane	8.41	72.5	93.3	117	72-131
106-97-8	Butane	10.3	76.6	101	119	66-128

⁽a) Outside control limits due to high level in sample relative to spike amount.



⁽b) Result is from Run #2.

^{* =} Outside of Control Limits.

Method: RSKSOP-147/175

Duplicate Summary Job Number: TC20874

PESTXST EarthCon Consultants Account:

Project: Quarterly Well Sampling, Parker County, Texas

Sample	File ID	DF	Analyzed	Ву	Prep Date	Prep Batch	Analytical Batch
TC20890-1DUP	SS005028.D	1	12/06/12	LT	n/a	n/a	GSS232
TC20890-1	SS005027.D	1	12/06/12	LT	n/a	n/a	GSS232
TC20890-1	SS005030.D	250	12/06/12	LT	n/a	n/a	GSS232

The QC reported here applies to the following samples:

TC20874-1

CAS No.	Compound	TC20890-1 ug/l Q	DUP ug/l	Q	RPD	Limits
74-82-8	Methane	20100 a	16400	E	21	53
74-85-1	Ethene	1.0 U	ND		nc	27
74-84-0	Ethane	3500 a	4020	E	14	43
74-98-6	Propane	66.8	99.1		39*	21
75-28-5	Isobutane	8.41	12.1		36*	35
106-97-8	Butane	10.3	15.1		38*	33

(a) Result is from Run #2.



^{* =} Outside of Control Limits.



ANALYSIS REPORT

Lab #: 321082 Job #: 20030

Sample Name/Number: WW11-And-120112
Company: Oil Tracers, LLC

Date Sampled: 12/01/2012

Container: Dissolved Gas Bottle

Field/Site Name: Third Quarter Well Sampling

Location: Parker County, Texas

Formation/Depth:

Sampling Point:

Date Received: 12/05/2012 Date Reported: 2/01/2013

Component	Chemical	$\delta^{13}C$	δD	$\delta^{18}O$
Component	mol. %	%。	%	‰
Carbon Monoxide	nd			
Hydrogen Sulfide	na			
Helium	na			
Hydrogen	nd			
Argon	1.70			
Oxygen	11.29			
Nitrogen	86.51			
Carbon Dioxide	0.34			
Methane	0.158			
Ethane	0.0029			
Ethylene	nd			
Propane	nd			
Propylene	nd			
Iso-butane	nd			
N-butane	nd			
Iso-pentane	nd			
N-pentane	nd			
Hexanes +	nd			

Remarks:

Analysis is of gas extracted from water by headspace equilibration. Analysis has been corrected for helium added to create headspace. Helium dilution factor = 0.79

nd = not detected. na = not analyzed. Isotopic composition of hydrogen is relative to VSMOW. Isotopic composition of carbon is relative to VPDB. Isotopic composition of oxygen is relative to VSMOW, except for carbon dioxide which is relative to VPDB. Calculations for BTU and specific gravity per ASTM D3588. Chemical compositions are normalized to 100%. Mol. % is approximately equal to vol. %.

^{*}Addition of helium negates the ability to detect native helium and may negate the ability to detect hydrogen.



12/12/12



Technical Report for

EarthCon Consultants

Quarterly Well Sampling, Parker County, Texas

3rd Quarter / WW10-Hay

Accutest Job Number: TC20882

Sampling Date: 12/02/12

Report to:

EarthCon Consultants 4800 Sugar Grove Suite 420 Stafford, TX 77477

gfloreslovo@earthcon.com; djackson@jacksonsjoberg.com; mcpatton@rangeresources.com; escott@earthcon.com

ATTN: Gabriela Floreslovo

Total number of pages in report: 26



Test results contained within this data package meet the requirements of the National Environmental Laboratory Accreditation Conference and/or state specific certification programs as applicable.

Richard Rollriguez Laboratory Director

Client Service contact: Elessa Sommers 713-271-4700

Certifications: TX (T104704220-12-8) AR (11-028-0) AZ (AZ0769) FL (E87628) KS (E-10366) LA (85695/04004) OK (211-035)

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Sample Summary

EarthCon Consultants

Job No: TC20882

Quarterly Well Sampling, Parker County, Texas Project No: 3rd Quarter / WW10-Hay

Sample	Collected		Matrix Received Code Type			Client	
Number	Date	Time By	Received	Code	Type	Sample ID	
TC20882-1	12/02/12	08:15	12/04/12	AQ	Ground Water	WW10-HAY-120212	





SAMPLE DELIVERY GROUP CASE NARRATIVE

Client: EarthCon Consultants Job No TC20882

Site: Quarterly Well Sampling, Parker County, Texas Report Date 12/12/2012 9:41:33 AM

1 Sample was collected on 12/02/2012 and received intact at Accutest on 12/04/2012 and properly preserved in 1 cooler at 2.4 Deg C. The sample received an Accutest job number of TC20882. A listing of the Laboratory Sample ID, Client Sample ID and date of collection are presented in the Results Summary Section of this report.

Except as noted below, all method specified calibrations and quality control performance criteria were met for this job. For more information, please refer to QC summary pages.

Volatiles by GCMS By Method SW846 8260B

Matrix AO Batch ID: VK578

- All samples were analyzed within the recommended method holding time.
- All method blanks for this batch meet method specific criteria.
- Sample(s) TC20506-1MS, TC20506-1MSD were used as the QC samples indicated.

Volatiles by GC By Method RSKSOP-147/175

Matrix AQ Batch ID: GSS233

- All samples were analyzed within the recommended method holding time.
- All method blanks for this batch meet method specific criteria.
- Sample(s) TC20879-1DUP, TC20970-2MS were used as the QC samples indicated.
- Matrix Spike Recovery for Methane is outside control limits. Outside control limits due to high level in sample relative to spike
- TC20970-2MS: Sample was not preserved to a pH < 2.

Accutest Laboratories Gulf Coast (ALGC) certifies that this report meets the project requirements for analytical data produced for the samples as received at ALGC and as stated on the COC. ALGC certifies that the data meets the Data QualityObjectives for precision, accuracy and completeness as specified in the ALGC Quality Manual except as noted above. This report is to be used in its entirety. ALGC is not responsible for any assumptions of data quality if partial data packages are used



Summary of Hits Job Number: TC20882

Account: EarthCon Consultants

Quarterly Well Sampling, Parker County, Texas 12/02/12**Project:**

Collected:

Lab Sample ID Analyte	Client Sample ID	Result/ Qual	MQL	SDL	Units	Method
TC20882-1	WW10-HAY-1202	212				
Methane		0.334	0.0050	0.0030	mg/l	RSKSOP-147/175
Ethane		0.0590	0.0010	0.00050	mg/l	RSKSOP-147/175
Propane		0.0113	0.0015	0.00075	mg/l	RSKSOP-147/175
Butane		0.0025	0.0015	0.00075	mg/l	RSKSOP-147/175



Sample Results	
Report of Analysis	



4

Report of Analysis

Client Sample ID: WW10-HAY-120212

 Lab Sample ID:
 TC20882-1
 Date Sampled:
 12/02/12

 Matrix:
 AQ - Ground Water
 Date Received:
 12/04/12

 Method:
 SW846 8260B
 Percent Solids:
 n/a

Project: Quarterly Well Sampling, Parker County, Texas

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	K13196.D	1	12/06/12	EM	n/a	n/a	VK578
Run #2							

	Purge Volume	
Run #1	5.0 ml	
Run #2		

Purgeable Aromatics

CAS No.	Compound	Result	MQL	SDL	Units	Q
71-43-2 108-88-3 100-41-4 1330-20-7	Benzene Toluene Ethylbenzene Xylene (total)	0.00034 U 0.00033 U 0.00032 U 0.00087 U	0.0010 0.0010 0.0010 0.0030	0.00034 0.00033 0.00032 0.00087	mg/l mg/l mg/l mg/l	
CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits		
1868-53-7 17060-07-0 2037-26-5 460-00-4	Dibromofluoromethane 1,2-Dichloroethane-D4 Toluene-D8 4-Bromofluorobenzene	109% 107% 105% 105%		72-122% 68-124% 80-119% 72-126%		

 $\begin{array}{ll} U = & Not \; detected & SDL \; - \; Sample \; Detection \; Limit \\ MQL = & Method \; Quantitation \; Limit \\ \end{array}$

E = Indicates value exceeds calibration range

J = Indicates an estimated value

B = Indicates analyte found in associated method blank N = Indicates presumptive evidence of a compound



1

Report of Analysis

Client Sample ID: WW10-HAY-120212

 Lab Sample ID:
 TC20882-1
 Date Sampled:
 12/02/12

 Matrix:
 AQ - Ground Water
 Date Received:
 12/04/12

 Method:
 RSKSOP-147/175
 Percent Solids:
 n/a

Project: Quarterly Well Sampling, Parker County, Texas

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	SS005073.D	1	12/07/12	LT	n/a	n/a	GSS233
Run #2	SS005075.D	10	12/07/12	LT	n/a	n/a	GSS233

RSK147 Special List

CAS No.	Compound	Result	MQL	SDL	Units	Q
74-82-8	Methane	0.334 a	0.0050	0.0030	mg/l	
74-85-1	Ethene	0.00050 U	0.0010	0.00050	mg/l	
74-84-0	Ethane	0.0590	0.0010	0.00050	mg/l	
74-98-6	Propane	0.0113	0.0015	0.00075	mg/l	
75-28-5	Isobutane	0.00075 U	0.0015	0.00075	mg/l	
106-97-8	Butane	0.0025	0.0015	0.00075	mg/l	

(a) Result is from Run# 2

U = Not detected

SDL - Sample Detection Limit

MQL = Method Quantitation Limit

E = Indicates value exceeds calibration range

J = Indicates an estimated value

B = Indicates analyte found in associated method blank N = Indicates presumptive evidence of a compound





Misc. Forms

Custody Documents and Other Forms

Includes the following where applicable:

- Chain of Custody
- LRC Form



CHAIN OF CUSTODY

BAC	Samuel S		man Grand	T

	ACCUTEST:														FED-EX	Tracking	#			ľ	Bottle Ord	der Contro	ol#			
-1111000	Laboratories			10165 Har	win Dr, Ste 1-271-4700	: 150 Hou FAX:	15ton. 713-2	TX 77 271-47	7036 70						Accutes	t Quote #					Accutest .	Job#	1/	30	10	87
						cutest.co	m			covered Co.	ครรณสม	88m495	viiliseasses	0439300						بل					70	Matrix Codes
Market S	Client / Reporting Information			Project	Informat	ion	19					10.00			_	_		Req	uest	ed /	Anai	yses	- T			Matrix Codes
Company	Name	Project Name:														a.							l		- 1	
	n Consultants, Inc.	Third Quarter	rly Well Samplii	ng, Parker C	County, 1	Texas					-					Butane, Ethane, Ethene, Isobutane, Methane, Propane by RSK-175			- 1		ļ		- 1	ļ	E	W - Drinking Water
Street Ado		Street			Service Control			A PARTY N	SECTION AND ADDRESS OF THE PARTY.			NESCO	(100 sept	(1848)/A	1	Met								1		WW - Water
	gar Grove Blvd., Suite 390			State		ng Information (if different from Report to) pany Name				1	e,			1						1	SW - Surface Water SO - Soil					
City	State Zip	1 1		Siate	Company	INGINO									1	nta							Ì	ı		SL- Sludge
Stafford		77 Project#			Street Ad	idress									1	gos					1		1	i	- 1	SED-Sediment OI - Oil
Project Co		T TOPESK II			1											e,							-	- 1	İ	LIQ - Other Liquid AIR - Air
Phone #	Floreslovo Fax #	Client Purchase	Order#		City				S	tate			Zip			thei 175										SOL - Other Solid WP - Wipe
281-201	-3513														4	, E							1	1		FB-Field Blank
Sampler(s	s) Name(s) Pho	ne# Project Manager	r		Attention	:									<u></u>	han										
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Accutest Sample #	Field ID / Point of Collection	Date	Time	Sampled By	Matrix	# of bottles	호	ZANa	HN03	NONE	DI Wa	함	NaHSO4	ENCORE	BTEX	B ar		ļ		İ				1	- 1	LAB USE ONLY
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	Turnaround Time (Business days)					Comme	roini		Deliv				rRRP		800000	MINIMA YES	(Secondarion)	distribution of	SATISTICS CONTROL	. 001		, - , -				
	Standard 5 Day RUSH	Approved By (Ac	cutest PM): / Date:		ᅵ片	Comme							EDD	Form	at											
	4 Day RUSH					FULT1					Ī		Other													
	3 Day RUSH					REDT1)								-									
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	Emergency & Rush T/A data available VIA La	. 092	20					Comr	mercia	I "C" =	Resu	ults +	QC &	Surro	gate Su	ımmary					1000000	1900	ese colores a	194 -03W		
		- 7-7-	Jampie Gustouy	must be doct	mented I	pelow ea	ach t	ime sa		s cha			essic	n, in	cludin	g cour	er deliv	Date 1	Time:		19050249300	ved By:		VI21912013360	energy and	
Redinquished by Sampler: Date Time:						_	<u> </u>	12	quisii	.cu by	•									2						
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TC20882: Chain of Custody Page 1 of 4







Accutest Laboratories Sample Receipt Summary

Accutest Job Number: TC20	Client:	EARTHCON C	ONSULTAN	TS	Project: 3RD QTR WELL SAMPLING,PARKER COUNTY,T					
Date / Time Received: 12/4/2	2012		Delivery Meth	od:	Client	Airbill #'s:				
No. Coolers: 1	Therm ID:	IR6				Temp Adjus	tment Factor:	0.2		
Cooler Temps (Initial/Adjusted	d): #1: (2.2	2/2.4)			_					
Cooler Security Y	or N		<u> Y</u>	or N	Sample Integr	rity - Docume	ntation_	<u>Y</u>	or N	<u> </u>
1. Custody Seals Present:		3. COC Pr	resent:		Sample label	ls present on bo	ittles:	✓		
2. Custody Seals Intact:	□ 4	. Smpl Date	s/Time OK		2. Container lab	•		✓]
Cooler Temperature	Y or N	<u>1_</u>			3. Sample conta	ainer label / CO	C agree:	✓]
1. Temp criteria achieved:	V				Sample Integ	ritv - Conditio	on	<u>Y</u>	or N	<u> </u>
Cooler temp verification:	Infared C	Gun			Sample recvo			✓		
3. Cooler media:	Ice (ba	g)			2. All containers			✓	Г	1
Quality Control Preservation	Y or	N N/A	WT	B STB	3. Condition of	sample:			Intact	
1. Trip Blank present / cooler:	V		✓		Sample Integ	rity - Instruct	ions	Υ	or N	N/A
2. Trip Blank listed on COC:					1. Analysis req	uested is clear:		<u> </u>		
3. Samples preserved properly:	✓ [2. Bottles recei	ived for unspeci	fied tests		<u>✓</u>	
4. VOCs headspace free:	✓ [3. Sufficient vo	lume recvd for a	analysis:	✓		
					4. Compositing	g instructions cle	ear:			\checkmark
					5. Filtering inst	tructions clear:				~
Comments -Received trip blank	not listed on	COC.			_					

TC20882: Chain of Custody Page 2 of 4

Page 1 of 3







Problem Resolution

Accutest Job Number: TC20882

CSR: Elessa Sommers Response Date: 12/5/2012

Response: Trip blank is on separate report.

15

TC20882: Chain of Custody Page 3 of 4









Sample Receipt Log

 Job #:
 TC20882
 Date / Time Received:
 12/4/2012 9:22:00 AM
 Initials:
 CH

Client: EARTHCON CONSULTANTS

Cooler #	Sample ID:	Vol	Bot #	Location	Pres	рН	Therm ID	Initial Temp	Therm CF	Corrected Temp
1	TC20882-1	40ml	1	VR	HCL	Note #1 - Preservative to be checked by analyst at the instrument.	IR6	2.2	0.2	2.4
1	TC20882-1	40ml	2	VR	HCL	Note #1 - Preservative to be checked by analyst at the instrument.	IR6	2.2	0.2	2.4
1	TC20882-1	40ml	3	VR	HCL	Note #1 - Preservative to be checked by analyst at the instrument.	IR6	2.2	0.2	2.4
1	TC20882-1	40ml	4	VR	HCL	Note #1 - Preservative to be checked by analyst at the instrument.	IR6	2.2	0.2	2.4
1	TC20882-1	40ml	5	VR	HCL	Note #1 - Preservative to be checked by analyst at the instrument.	IR6	2.2	0.2	2.4
1	TC20882-1	40ml	6	VR	HCL	Note #1 - Preservative to be checked by analyst at the instrument.	IR6	2.2	0.2	2.4

TC20882: Chain of Custody

Page 4 of 4



Laboratory Data Package Cover Page Appendix A

This signature page, the laboratory review checklist, and the following reportable data:

TC20882 This data package consists of

[]

QA Manager Name (Printed)

Richard Rodriguez

Signature

ė	R1	Field chain-of-custody documentation;	3 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4
□	R2	Sample identification cross-reference;	
D	R3	Test reports (analytical data sheets) for each	ch environmental sample that includes:
		a) Items	s consistent with NELAC 5.13 or ISO/IEC 17025 Section 5.10
		b) diluti	on factors,
		c) prep	aration methods,
		d) clear	nup methods, and
		e) if req	uired for the project, tentatively identified compounds (TICs).
Ģ	R4	Surrogate recovery data including:	
		a) Calc	ulated recovery (%R), and
		b) The	aboratory's surrogate QC limits.
Ģ	R5	Test reports/summary forms for blank sam	oles;
Ģ	R6	Test reports/summary forms for laboratory	control samples (LCSs) including:
		a) LCS	spiking amounts,
		b) Calc	ulated %R for each analyte, and
		c) The	laboratory's LCS QC limits.
	R7	Test reports for project matrix spike/matrix	spike duplicates (MS/MSDs) including:
		a) Sam	ples associated with the MS/MSD clearly identified,
		b) MS/N	MSD spiking amounts,
		c) Cond	centration of each MS/MSD analyte measured in the parent and
		d) Calc	ulated %Rs and relative percent differences (RPDs), and
		e) The	aboratory's MS/MSD QC limits
	R8	Laboratory analytical duplicate (if applicable	e) recovery and precision:
		a) The	amount of analyte measured in the duplicate,
		b) The	calculated RPD, and
		c) The	aboratory's QC limits for analytical duplicates.
	R9	List of method quantitation limits (MQLs) a	nd detectability check sample results for each analyte for each
	R10	Other problems or anomalies.	
The Exce	ption Report	t for each "No" or "Not Reviewed (NR)" item	n Laboratory Review Checklist and for each analyte, matrix, and
method fo	or which the l	laboratory does not hold NELAC accreditation	on under the Texas Laboratory Accreditation Program.
Texas Lab the Excep requirement affirm to the the data, I	poratory Acc stion Report. ents of the m the best of m	creditation Program for all the methods, analy. This data package has been reviewed by the nethods used, except where noted by the lab by knowledge, all problems/anomalies, obser	ratory data package. This laboratory is NELAC accredited under the rtes, and matrices reported in this data package except as noted in e laboratory and is complete and technically compliant with the oratory in the attached exception reports. By my signature below, I ved by the laboratory as having the potential to affect the quality of Review Checklist, and no information or data have been knowingly
withheld.	applicable:	: This laboratory meets an exception under	30 TAC&25.6 and was last inspection by
[]	.,		
		noted in the Exception Reports herein. The	ony findings affecting the data in this laboratory data package are official signing the cover page of the report in which these data are backage and is by signature affirming the above release statement

Official Title (printed)

Laboratory Director

Date 12/12/2012



Laboration 1			CHECKLIST: REPORTABLE			012		
Laboratory	Name:	Accutest Gulf Coast	Accutest Gulf Coast LRC Date: Quarterly Well Sampling, Parker					
D N.			Laborator BudadN adag					
Project Na		County, Texas Anita Patel	Laboratory Project Number:	_	2088			
Reviewer #1	Name:	DESCRIPTION	Prep Batch Number(s):	GSS				ER#5
# R1	OI	CHAIN-OF-CUSTODY (C-O-C):		IES	INO	INA	INK	EK#
IXI	- 01		andard conditions of sample acceptability				1	
		upon receipt?	and and conditions of sample acceptability	X				
			anditions described in an exception report?	X				
R2	OI	Sample and quality control (QC) id		T A				
- '\-			s-referenced to the laboratory ID numbers?	X	ı	ī	ī	1
		•	eferenced to the corresponding QC data?	T X				
R3	OI	Test reports	elerenced to the corresponding QC data:	+^				
KS	0	Were samples prepared and analyze	d within holding times?	Х	1	1	1	
			all other raw values bracketed by calibration					
		standards?	all other raw values bracketed by calibration	X				
		Were calculations checked by a peer	or supervisor?	X				
		Were all analyte identifications check		T X				
		Were sample detection limits reported		X				
		Were all results for soil and sediment	† ^`		Х			
		Were % moisture (or solids) reported	1		X			
			latile analysis extracted with methanol per					
		SW846 Method 5035?				Х		
		If required for the project, are TIC's re	eported?			Х		
R4	0	Surrogate recovery data						
		Were surrogates added prior to extra	Х					
		ŭ .	all samples within the laboratory QC limits?	X				
R5	OI	Test reports/summary forms for bl						
		Were appropriate type(s) of blanks ar	•	Х				
		Were blanks analyzed at the appropr		X				
			ne entire analytical process, including	l x				
		preparation and, if applicable, cleanu	p procedures?	- V				
		Were blank concentrations <mql?< td=""><td></td><td>X</td><td></td><td></td><td></td><td></td></mql?<>		X				
R6	OI	Laboratory control samples (LCS): Were all COCs included in the LCS?			ı .	1	1	
			ire analytical procedure, including prep and	X				
		cleanup steps?	are analytical procedure, including prep and	Х				
		Were LCSs analyzed at required freq	ujency?	X				
		Were LCS (and LCSD, if applicable)		T X				
			data document the laboratory's capability to					
		detect the COCs at the MDL used to		X				5
		Was the LCSD RPD within QC limits				Х		
R7	OI	Matrix spike (MS) and matrix spike						
			nalytes included in the MS and MSD?	Х		1	1	
		Were MS/MSD analyzed at the appro		Х				
		Were MS (and MSD, if applicable) %	Rs within the laboratory QC Limits?		Х			4
		Were the MS/MSD RPDs within labo	ratory QC limits?	Х				
R8	OI	Analytical duplicate data						
		Were appropriate analytical duplicate	es analyzed for each matrix?	Х				
		Were analytical duplicates analyzed a	at the appropriate frequency?	Х				
		Were RPDs or relative standard devia	ations within the laboratory QC limits?	Х				
R9	OI	Method quantitation limits (MQLs):						
		Are the MQLs for each method analyt	te included in the laboratory data package?	Х				
			entration of the lowest non-zero calibration	Х				
		· · · · · · · · · · · · · · · · · · ·	uded in the laboratory data package?		Х			2
R10	OI	Other problems/anomalies						
			pecial conditions noted in this LRC and ER?	X				
			logy used to lower the SDL to minimize the	Х				
		,	inder the Texas Laboratory Accreditation	1		1	1	
			nd methods associated with this laboratory	X				3
		data package?						



Laboratory		Accutest Gulf Coast LRC Date:		2/2012	2	
Project Na		Quarterly Well Sampling, Parker Laboratory Project Number:	_	20882		
Reviewer	Name:	Anita Patel Prep Batch Number(s):		33, VK		
# ¹	A ²	DESCRIPTION	YES	NO NA	NR	⁴ ER # ⁵
S1	OI	Initial calibration (ICAL)				
		Were response factors and/or relative response factors for each analyte within QC	l x l			
		limits?				
		Were percent RSDs or correlation coefficient criteria met?	Х			
		Was the number of standards recommended in the method used for all analytes?	X			
		Were all points generated between the lowest and highest standard used to	l x l			
		calculate the curve?	 , 	_		-
		Are ICAL data available for all instruments used?	Х		_	-
		Has the initial calibration curve been verified using an appropriate second source standard?	Х			
S2	OI	Initial and continuing calibration verification (ICCV AND CCV) and continuing				
		Was the CCV analyzed at the method-required frequency?	X			
		Were percent differences for each analyte within the method-required QC limits?	Х			
		Was the ICAL curve verified for each analyte?	Х			
		Was the absolute value of the analyte concentration in the inorganic CCB <mdl?< td=""><td></td><td>></td><td></td><td></td></mdl?<>		>		
S3	0	Mass spectral tuning				
		Was the appropriate compound for the method used for tuning?	X			
		Were ion abundance data within the method-required QC limits?	Х			
S4	0	Internal standards (IS)				
		Were IS area counts and retention times within the method-required QC limits?	X			
S5	OI	Raw data (NELAC Section 5.5.10)				
		Were the raw data (for example, chromatograms, spectral data) reviewed by an	x			
		analyst?				
		Were data associated with manual integrations flagged on the raw data?	Х			
S6	0	Dual column confirmation				
		Did dual column confirmation results meet the method-required QC?	\sqcup	X		
S7	0	Tentatively identified compounds (TICs):				
		If TICs were requested, were the mass spectra and TIC data subject to appropriate		\ \		
		checks?	\sqcup		`	
S8	ı	Interference Check Sample (ICS) results	_		. 1	
		Were percent recoveries within method QC limits?	\sqcup	X		
S9	ı	Serial dilutions, post digestion spikes, and method of standard additions			_	
		Were percent differences, recoveries, and the linearity within the QC limits		×		
		specified in the method?	\sqcup			
S10	OI	Method detection limit (MDL) studies	- V I		_	_
		Was a MDL study performed for each reported analyte?	X		_	+
044		Is the MDL either adjusted or supported by the analysis of DCSs?	X			5
S11	OI	Proficiency test reports			_	_
		Was the laboratory's performance acceptable on the applicable proficiency tests or evaluation studies?	X			
S12	OI	Standards documentation	\vdash			
512	OI OI	Are all standards used in the analyses NIST-traceable or obtained from other	_	_	_	_
		appropriate source?	X			
S13	OI	Compound/analyte identification procedures				
313	0	Are the procedures for compound/analyte identification documented?	Х		_	т —
		Demonstration of analyst competency (DOC)		_	_	
S11		Demonstration of analyst competency (DOC)				
S14	OI		Y I	- 1		
S14	OI	Was DOC conducted consistent with NELAC Chapter 5?	X			+
		Was DOC conducted consistent with NELAC Chapter 5? Is documentation of the analyst's competency up-to-date and on file?	X			
S14 S15	OI	Was DOC conducted consistent with NELAC Chapter 5? Is documentation of the analyst's competency up-to-date and on file? Verification/validation documentation for methods (NELAC Chapter 5)	Х			
		Was DOC conducted consistent with NELAC Chapter 5? Is documentation of the analyst's competency up-to-date and on file? Verification/validation documentation for methods (NELAC Chapter 5) Are all the methods used to generate the data documentated, verified, and				
		Was DOC conducted consistent with NELAC Chapter 5? Is documentation of the analyst's competency up-to-date and on file? Verification/validation documentation for methods (NELAC Chapter 5)	Х			



Laboratory	Name:	Accutest Gulf Coast	LRC Date:	12/12/2012								
Project Na	me:	Quarterly Well Sampling, Parket	Laboratory Project Number:	TC20882								
Reviewer	Name:	Anita Patel	Prep Batch Number(s):	GSS233, VK578								
ER# ¹	Descripti	on										
			ne report as the RL. The unadjusted MQL/R	is reported in the method								
11	blank. The SDL is defined in the report as the MDL. For reporting purposes, the method blank represents the unadjusted MOL. The DCS is on file in the laboratory and is not											
2	For reporting purposes, the method blank represents the unadjusted MQL. The DCS is on file in the laboratory and is not included in the laboratory data package.											
3	The laboratory is NELAC-accredited under the Texas Laboratory Accreditation Program for the analytes, matrices, and methods associated with this laboratory data package for analytes that are listed in the Texas Fields of Accreditation.											
4	All anoma	lies are discussed in the case narrativ	e.									
5	1	atory does not perform DCS analysis f ve values in the Texas TRRP PCL tab	or Method RSKSOP-147/175. The componies.	ents reported are not listed o								
		<u> </u>										
	l											

1ER# = Exception Report identification number (an Exception Report should be completed for an item if "NR" or "No" is checked on





GC/MS Volatiles

QC Data Summaries

Includes the following where applicable:

- Method Blank Summaries
- Blank Spike Summaries
- Matrix Spike and Duplicate Summaries



Method: SW846 8260B

Method Blank Summary Job Number: TC20882

PESTXST EarthCon Consultants **Account:**

Project: Quarterly Well Sampling, Parker County, Texas

Sample VK578-MB	File ID K13177.D	DF 1	Analyzed 12/06/12	By EM	Prep Date n/a	Prep Batch n/a	Analytical Batch VK578

The QC reported here applies to the following samples:

CAS No.	Compound	Result	RL	MDL	Units Q
71-43-2	Benzene	ND	1.0	0.34	ug/l
100-41-4	Ethylbenzene	ND	1.0	0.32	ug/l
108-88-3	Toluene	ND	1.0	0.33	ug/l
1330-20-7	Xylene (total)	ND	3.0	0.87	ug/l

CAS No.	Surrogate Recoveries	te Recoveries			
1868-53-7	Dibromofluoromethane	107%	72-122%		
17060-07-0	1,2-Dichloroethane-D4	105%	68-124%		
2037-26-5	Toluene-D8	107%	80-119%		
460-00-4	4-Bromofluorobenzene	103%	72-126%		



Method: SW846 8260B

Blank Spike Summary Job Number: TC20882

Account: PESTXST EarthCon Consultants

Quarterly Well Sampling, Parker County, Texas **Project:**

Sample VK578-BS	File ID K13175.D	DF 1	Analyzed 12/06/12	By EM	Prep Date n/a	Prep Batch n/a	Analytical Batch VK578

The QC reported here applies to the following samples:

CAS No.	Compound	Spike ug/l	BSP ug/l	BSP %	Limits
71-43-2	Benzene	25	23.5	94	68-119
100-41-4	Ethylbenzene	25	23.4	94	71-117
108-88-3	Toluene	25	23.0	92	73-119
1330-20-7	Xylene (total)	75	71.7	96	74-119

CAS No.	Surrogate Recoveries	BSP	Limits
1868-53-7	Dibromofluoromethane	105%	72-122%
17060-07-0	1,2-Dichloroethane-D4	103%	68-124%
2037-26-5	Toluene-D8	105%	80-119%
460-00-4	4-Bromofluorobenzene	101%	72-126%



^{* =} Outside of Control Limits.

6.3.1

Page 1 of 1

Method: SW846 8260B

σ

Matrix Spike/Matrix Spike Duplicate Summary

Job Number: TC20882

Account: PESTXST EarthCon Consultants

Project: Quarterly Well Sampling, Parker County, Texas

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
TC20506-1MS	K13179.D	1	12/06/12	EM	n/a	n/a	VK578
TC20506-1MSD	K13180.D	1	12/06/12	EM	n/a	n/a	VK578
TC20506-1	K13178.D	1	12/06/12	EM	n/a	n/a	VK578

The QC reported here applies to the following samples:

CAS No.	Compound	TC20506-1 ug/l Q	Spike ug/l	MS ug/l	MS %	MSD ug/l	MSD %	RPD	Limits Rec/RPD
71-43-2	Benzene	ND	25	23.4	94	23.1	92	1	68-119/12
100-41-4	Ethylbenzene	ND	25	22.9	92	22.6	90	1	71-117/12
108-88-3	Toluene	ND	25	23.0	92	22.1	88	4	73-119/13
1330-20-7	Xylene (total)	ND	75	71.6	95	69.3	92	3	74-119/13

CAS No.	Surrogate Recoveries	rogate Recoveries MS MSD		TC20506-1	Limits	
1868-53-7	Dibromofluoromethane	108%	108%	105%	72-122%	
17060-07-0	1,2-Dichloroethane-D4	103%	105%	104%	68-124%	
2037-26-5	Toluene-D8	107%	105%	106%	80-119%	
460-00-4	4-Bromofluorobenzene	103%	104%	104%	72-126%	



^{* =} Outside of Control Limits.



GC Volatiles

QC Data Summaries

Includes the following where applicable:

- Method Blank Summaries
- Blank Spike Summaries
- Matrix Spike and Duplicate Summaries



Method: RSKSOP-147/175

Method Blank Summary Job Number: TC20882

Account: PESTXST EarthCon Consultants

Quarterly Well Sampling, Parker County, Texas **Project:**

Sample GSS233-MB	File ID SS005056.D	DF 1	Analyzed 12/07/12	By LT	Prep Date n/a	Prep Batch n/a	Analytical Batch GSS233

The QC reported here applies to the following samples:

CAS No.	Compound	Result	RL	MDL	Units Q
74-82-8	Methane	ND	0.50	0.30	ug/l
74-85-1	Ethene	ND	1.0	0.50	ug/l
74-84-0	Ethane	ND	1.0	0.50	ug/l
74-98-6	Propane	ND	1.5	0.75	ug/l
75-28-5	Isobutane	ND	1.5	0.75	ug/l
106-97-8	Butane	ND	1.5	0.75	ug/l



Method: RSKSOP-147/175

Blank Spike Summary Job Number: TC20882

Account: PESTXST EarthCon Consultants

Quarterly Well Sampling, Parker County, Texas **Project:**

Sample GSS233-BS	File ID SS005054.D	DF 1	Analyzed 12/07/12	By LT	Prep Date n/a	Prep Batch n/a	Analytical Batch GSS233

The QC reported here applies to the following samples:

CAS No.	Compound	Spike ug/l	BSP ug/l	BSP %	Limits
74-82-8	Methane	21.5	16.2	75	68-139
74-85-1	Ethene	57.4	43.2	75	52-145
74-84-0	Ethane	43.3	47.1	109	68-131
74-98-6	Propane	60.6	60.5	100	69-131
75-28-5	Isobutane	72.5	70.4	97	72-131
106-97-8	Butane	76.6	73.6	96	66-128



^{* =} Outside of Control Limits.

Method: RSKSOP-147/175

Matrix Spike Summary

Job Number: TC20882

PESTXST EarthCon Consultants Account:

Project: Quarterly Well Sampling, Parker County, Texas

Sample TC20970-2MS ^a TC20970-2 ^a	File ID SS005067.D SS005066.D	Analyzed 12/07/12 12/07/12	By LT LT	Prep Date n/a n/a	Prep Batch n/a n/a	Analytical Batch GSS233 GSS233

The QC reported here applies to the following samples:

CAS No.	Compound	TC20970-2 ug/l Q	Spike ug/l	MS ug/l	MS %	Limits
74-82-8	Methane	105	21.5	95.8	-42* b	68-139
74-85-1	Ethene	ND	57.4	46.6	81	52-145
74-84-0	Ethane	4.71	43.3	46.7	97	68-131
74-98-6	Propane	ND	60.6	53.4	88	69-131
75-28-5	Isobutane	ND	72.5	61.8	85	72-131
106-97-8	Butane	ND	76.6	66.0	86	66-128

⁽a) Sample was not preserved to a pH < 2.



⁽b) Outside control limits due to high level in sample relative to spike amount.

^{* =} Outside of Control Limits.

Method: RSKSOP-147/175

Duplicate Summary Job Number: TC20882

PESTXST EarthCon Consultants Account:

Project: Quarterly Well Sampling, Parker County, Texas

Sample TC20879-1DUP TC20879-1	File ID SS005062.D SS005061.D	Analyzed 12/07/12 12/07/12	By LT LT	Prep Date n/a n/a	Prep Batch n/a n/a	Analytical Batch GSS233 GSS233

The QC reported here applies to the following samples:

CAS No.	Compound	TC20879-1 ug/l Q	DUP ug/l Q	RPD	Limits
74-82-8	Methane	4.10	3.34	20	53
74-85-1	Ethene	1.0 U	ND	nc	27
74-84-0	Ethane	1.0 U	ND	nc	43
74-98-6	Propane	1.5 U	ND	nc	21
75-28-5	Isobutane	1.5 U	ND	nc	35
106-97-8	Butane	1.5 U	ND	nc	33



^{* =} Outside of Control Limits.



12/12/12



Technical Report for

EarthCon Consultants

Quarterly Well Sampling, Parker County, Texas

3rd Quarter / WW20-Huf

Accutest Job Number: TC20875

Sampling Date: 12/01/12

Report to:

EarthCon Consultants 4800 Sugar Grove Suite 420 Stafford, TX 77477

gfloreslovo@earthcon.com; djackson@jacksonsjoberg.com; mcpatton@rangeresources.com; escott@earthcon.com

ATTN: Gabriela Floreslovo

Total number of pages in report: 26



Test results contained within this data package meet the requirements of the National Environmental Laboratory Accreditation Conference and/or state specific certification programs as applicable.

Richard Rollriguez Laboratory Director

Client Service contact: Elessa Sommers 713-271-4700

Certifications: TX (T104704220-12-8) AR (11-028-0) AZ (AZ0769) FL (E87628) KS (E-10366) LA (85695/04004) OK (211-035)

This report shall not be reproduced, except in its entirety, without the written approval of Accutest Laboratories. Test results relate only to samples analyzed.

1 of 26

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TC20875

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Sample Summary

EarthCon Consultants

Job No:

TC20875

Quarterly Well Sampling, Parker County, Texas Project No: 3rd Quarter / WW20-Huf

Sample Collected			Matr	ix	Client	
Number	Date	Time By	Received	Code	Type	Sample ID
TC20875-1	12/01/12	09:28	12/04/12	AQ	Ground Water	WW20-HUF-120112





SAMPLE DELIVERY GROUP CASE NARRATIVE

Client: EarthCon Consultants Job No TC20875

Site: Quarterly Well Sampling, Parker County, Texas Report Date 12/12/2012 12:12:44 P

1 Sample was collected on 12/01/2012 and received intact at Accutest on 12/04/2012 and properly preserved in 1 cooler at 2.4 Deg C. The sample received an Accutest job number of TC20875. A listing of the Laboratory Sample ID, Client Sample ID and date of collection are presented in the Results Summary Section of this report.

Except as noted below, all method specified calibrations and quality control performance criteria were met for this job. For more information, please refer to QC summary pages.

Volatiles by GCMS By Method SW846 8260B

Matrix AO Batch ID: VX1673

- All samples were analyzed within the recommended method holding time.
- All method blanks for this batch meet method specific criteria.
- Sample(s) TC20864-1MS, TC20864-1MSD were used as the QC samples indicated.

Volatiles by GC By Method RSKSOP-147/175

Matrix AQ Batch ID: GSS232

- All samples were analyzed within the recommended method holding time.
- All method blanks for this batch meet method specific criteria.
- Sample(s) TC20890-1DUP, TC20890-1MS were used as the QC samples indicated.
- Matrix Spike Recovery(s) for Ethene, Propane are outside control limits. Probable cause due to matrix interference.
- Matrix Spike Recovery(s) for Ethane, Methane are outside control limits. Outside control limits due to high level in sample relative to spike amount.
- RPD(s) for Duplicate for Butane, Isobutane, Propane are outside control limits for sample TC20890-1DUP.

Accutest Laboratories Gulf Coast (ALGC) certifies that this report meets the project requirements for analytical data produced for the samples as received at ALGC and as stated on the COC. ALGC certifies that the data meets the Data QualityObjectives for precision, accuracy and completeness as specified in the ALGC Quality Manual except as noted above. This report is to be used in its entirety. ALGC is not responsible for any assumptions of data quality if partial data packages are used



Summary of Hits Job Number: TC20875

Account: EarthCon Consultants

Quarterly Well Sampling, Parker County, Texas 12/01/12**Project:**

Collected:

Lab Sample ID Analyte	Client Sample ID	Result/ Qual	MQL	SDL	Units	Method		
TC20875-1	WW20-HUF-120112							
Methane Ethane		0.669 0.0213	0.0050 0.0010	0.0030 0.00050	mg/l mg/l	RSKSOP-147/175 RSKSOP-147/175		



Sample Results		
Report of Analysis		



4

Report of Analysis

Client Sample ID: WW20-HUF-120112

 Lab Sample ID:
 TC20875-1
 Date Sampled:
 12/01/12

 Matrix:
 AQ - Ground Water
 Date Received:
 12/04/12

 Method:
 SW846 8260B
 Percent Solids:
 n/a

Project: Quarterly Well Sampling, Parker County, Texas

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	X0087072.D	1	12/06/12	CF	n/a	n/a	VX1673
Run #2							

	Purge Volume	
Run #1	5.0 ml	
Run #2		

Purgeable Aromatics

CAS No.	Compound	Result	MQL	SDL	Units	Q
71-43-2 108-88-3 100-41-4 1330-20-7	Benzene Toluene Ethylbenzene Xylene (total)	0.00034 U 0.00033 U 0.00032 U 0.00087 U	0.0010 0.0010 0.0010 0.0030	0.00034 0.00033 0.00032 0.00087	mg/l mg/l mg/l mg/l	
CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits		
1868-53-7 17060-07-0 2037-26-5 460-00-4	Dibromofluoromethane 1,2-Dichloroethane-D4 Toluene-D8 4-Bromofluorobenzene	107% 96% 100% 99%		72-122% 68-124% 80-119% 72-126%		

 $\begin{array}{ll} U = & Not \; detected & SDL \; - \; Sample \; Detection \; Limit \\ MQL = & Method \; Quantitation \; Limit \\ \end{array}$

E = Indicates value exceeds calibration range

J = Indicates an estimated value

B = Indicates analyte found in associated method blank N = Indicates presumptive evidence of a compound



Report of Analysis

Client Sample ID: WW20-HUF-120112

 Lab Sample ID:
 TC20875-1
 Date Sampled:
 12/01/12

 Matrix:
 AQ - Ground Water
 Date Received:
 12/04/12

 Method:
 RSKSOP-147/175
 Percent Solids:
 n/a

Project: Quarterly Well Sampling, Parker County, Texas

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	SS005045.D	1	12/06/12	LT	n/a	n/a	GSS232
Run #2	SS005048.D	10	12/06/12	LT	n/a	n/a	GSS232

RSK147 Special List

CAS No.	Compound	Result	MQL	SDL	Units	Q
74-82-8	Methane	0.669 a	0.0050	0.0030	mg/l	
74-85-1	Ethene	0.00050 U	0.0010	0.00050	mg/l	
74-84-0	Ethane	0.0213	0.0010	0.00050	mg/l	
74-98-6	Propane	0.00075 U	0.0015	0.00075	mg/l	
75-28-5	Isobutane	0.00075 U	0.0015	0.00075	mg/l	
106-97-8	Butane	0.00075 U	0.0015	0.00075	mg/l	

(a) Result is from Run# 2

U = Not detected

SDL - Sample Detection Limit

MQL = Method Quantitation Limit

E = Indicates value exceeds calibration range

J = Indicates an estimated value

B = Indicates analyte found in associated method blank N = Indicates presumptive evidence of a compound





Misc. Forms

Custody Documents and Other Forms

Includes the following where applicable:

- Chain of Custody
- LRC Form



PAGE __ OF __

CHAIN OF CUSTODY

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TC20875: Chain of Custody Page 1 of 4





Accutest Laboratories Sample Receipt Summary

Client: EARTHCON CONSULTANTS Project: 3RD QTR WELL SAMPLING, PARKER COUNTY, T Accutest Job Number: TC20875 Delivery Method: Client Airbill #'s: Date / Time Received: 12/4/2012 No. Coolers: 1 Temp Adjustment Factor: 0.2 Therm ID: IR6 Cooler Temps (Initial/Adjusted): #1: (2.2/2.4) Cooler Security Y or N Y or N Sample Integrity - Documentation Y or N 3. COC Present: **v** 1. Custody Seals Present: **V** 1. Sample labels present on bottles: 4. Smpl Dates/Time OK \checkmark 2. Custody Seals Intact: **~** 2. Container labeling complete: 3. Sample container label / COC agree: ✓ **Cooler Temperature** Y or N 1. Temp criteria achieved: N Sample Integrity - Condition Infared Gun 2. Cooler temp verification: **~** 1. Sample recvd within HT: 3. Cooler media: Ice (bag) 2. All containers accounted for: **V** STB **Quality Control Preservation** Y or N N/A WTB 3. Condition of sample: Intact 1. Trip Blank present / cooler: ✓ ✓ Y or N N/A Sample Integrity - Instructions **~** 2. Trip Blank listed on COC: 1. Analysis requested is clear: ✓ **V** 3. Samples preserved properly: 2. Bottles received for unspecified tests ✓ 4. VOCs headspace free: **V** 3. Sufficient volume recvd for analysis: **~** 4. Compositing instructions clear: \checkmark 5. Filtering instructions clear: **V** Comments -Received trip blank not listed on COC.

> TC20875: Chain of Custody Page 2 of 4

Page 1 of 3







Problem Resolution

Accutest Job Number: TC20875

CSR: Elessa Sommers Response Date: 12/5/2012

Response: Trip blank is on separate report.

TC20875: Chain of Custody Page 3 of 4







Sample Receipt Log

 Job #:
 TC20875
 Date / Time Received:
 12/4/2012 9:22:00 AM
 Initials:
 CH

Client: EARTHCON CONSULTANTS

Cooler #	Sample ID:	Vol	Bot #	Location	Pres	рН	Therm ID	Initial Temp	Therm CF	Corrected Temp
1	TC20875-1	40ml	1	VR	HCL	Note #1 - Preservative to be checked by analyst at the instrument.	IR6	2.2	0.2	2.4
1	TC20875-1	40ml	2	VR	HCL	Note #1 - Preservative to be checked by analyst at the instrument.	IR6	2.2	0.2	2.4
1	TC20875-1	40ml	3	VR	HCL	Note #1 - Preservative to be checked by analyst at the instrument.	IR6	2.2	0.2	2.4
1	TC20875-1	40ml	4	VR	HCL	Note #1 - Preservative to be checked by analyst at the instrument.	IR6	2.2	0.2	2.4
1	TC20875-1	40ml	5	VR	HCL	Note #1 - Preservative to be checked by analyst at the instrument.	IR6	2.2	0.2	2.4
1	TC20875-1	40ml	6	VR	HCL	Note #1 - Preservative to be checked by analyst	IR6	2.2	0.2	2.4

TC20875: Chain of Custody

Page 4 of 4



Laboratory Data Package Cover Page Appendix A

This signature page, the laboratory review checklist, and the following reportable data:

TC20875 This data package consists of

QA Manager Name (Printed)

Richard Rodriguez

is true.

Signature

ė	R1	Field chain-of-custody documentation	η;
	R2	Sample identification cross-reference	
	R3	Test reports (analytical data sheets) f	or each environmental sample that includes:
		a)	Items consistent with NELAC 5.13 or ISO/IEC 17025 Section 5.10
		b)	dilution factors,
		c)	preparation methods,
		d)	cleanup methods, and
		e)	if required for the project, tentatively identified compounds (TICs).
	R4	Surrogate recovery data including:	
		a)	Calculated recovery (%R), and
		b)	The laboratory's surrogate QC limits.
	R5	Test reports/summary forms for blank	samples;
	R6	Test reports/summary forms for labor	ratory control samples (LCSs) including:
		a)	LCS spiking amounts,
		b)	Calculated %R for each analyte, and
		c)	The laboratory's LCS QC limits.
	R7	Test reports for project matrix spike/n	natrix spike duplicates (MS/MSDs) including:
		a)	Samples associated with the MS/MSD clearly identified,
		b)	MS/MSD spiking amounts,
		c)	Concentration of each MS/MSD analyte measured in the parent and
		d)	Calculated %Rs and relative percent differences (RPDs), and
		e)	The laboratory's MS/MSD QC limits
	R8	Laboratory analytical duplicate (if app	olicable) recovery and precision:
		a)	The amount of analyte measured in the duplicate,
		b)	The calculated RPD, and
		c)	The laboratory's QC limits for analytical duplicates.
	R9	List of method quantitation limits (MC	Ls) and detectability check sample results for each analyte for each
	R10	Other problems or anomalies.	
The Excep	tion Report	for each "No" or "Not Reviewed (NR)"	item in Laboratory Review Checklist and for each analyte, matrix, and
method for	which the I	aboratory does not hold NELAC accre	ditation under the Texas Laboratory Accreditation Program.
Release S	tatement:	I am responsible for the release of this	s laboratory data package. This laboratory is NELAC accredited under the
Texas Lab	oratory Acci	reditation Program for all the methods,	analytes, and matrices reported in this data package except as noted in
the Except	ion Report.	This data package has been reviewed	by the laboratory and is complete and technically compliant with the
requiremen	nts of the m	ethods used, except where noted by the	ne laboratory in the attached exception reports. By my signature below, I
affirm to th	e best of my	/ knowledge, all problems/anomalies,	observed by the laboratory as having the potential to affect the quality of
the data, h	ave been id	entified by the laboratory in the Labora	atory Review Checklist, and no information or data have been knowingly
withheld.			
Check, if	applicable:	This laboratory meets an exception u	nder 30 TAC&25.6 and was last inspection by
[]		[X] TCEQ or [] on April 20	O11. Any findings affecting the data in this laboratory data package are
			n. The official signing the cover page of the report in which these data are
			data package and is by signature affirming the above release statement

Official Title (printed)

Laboratory Director

Date

12/12/2012



	ı	ABORATORY REVIEW	HECKLIST: REPORTABLE	DAT	Ά					
Laboratory		Accutest Gulf Coast	LRC Date:		12/2	012				
Laboratory	ivanio.	Quarterly Well Sampling, Parker		12	12/2	012				
Project Na	me:	County, Texas	TC20875							
Reviewer	Name:	Anita Patel	Laboratory Project Number: Prep Batch Number(s):	GSS232, VX1673						
#1	A ²	DESCRIPTION	Trop Edicit Hambor(o).					ER #5		
R1	OI	CHAIN-OF-CUSTODY (C-O-C):								
			andard conditions of sample acceptability	\ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \						
		upon receipt?	, , ,	X						
		Were all departures from standard co	onditions described in an exception report?	Х						
R2	OI	Sample and quality control (QC) id	lentification							
		Are all field sample ID numbers cross	s-referenced to the laboratory ID numbers?	Х						
		Are all laboratory ID numbers cross-r	e all laboratory ID numbers cross-referenced to the corresponding QC data?							
R3	OI	Test reports	·							
		Were samples prepared and analyze	ed within holding times?	Х						
		Other than those results <mql, td="" were<=""><td>all other raw values bracketed by calibration</td><td>X</td><td></td><td></td><td></td><td></td></mql,>	all other raw values bracketed by calibration	X						
		standards?		X						
		Were calculations checked by a peer	or supervisor?	Х						
		Were all analyte identifications check		Х						
		Were sample detection limits reporte		Х						
			t samples reported on a dry weight basis?			Х				
		Were % moisture (or solids) reported				Х				
			platile analysis extracted with methanol per			Х				
		SW846 Method 5035?								
		If required for the project, are TIC's re			Χ					
R4	0	Surrogate recovery data Were surrogates added prior to extra	ation?	V						
			all samples within the laboratory QC limits?	X						
R5	OI	Test reports/summary forms for bl	· · · · · · · · · · · · · · · · · · ·	+^						
11.3	- 01	Were appropriate type(s) of blanks a		X						
		Were blanks analyzed at the appropri	· ·	X						
			he entire analytical process, including							
		preparation and, if applicable, cleanu		X						
		Were blank concentrations <mql?< td=""><td>p procedures.</td><td>T X</td><td></td><td></td><td></td><td></td></mql?<>	p procedures.	T X						
R6	OI	Laboratory control samples (LCS)								
		Were all COCs included in the LCS?		Х	Π					
		Was each LCS taken through the ent	tire analytical procedure, including prep and	Х						
		cleanup steps?		^						
		Were LCSs analyzed at required free	quency?	Х						
			%Rs within the laboratory QC limits?	X						
			data document the laboratory's capability to	X				5		
		detect the COCs at the MDL used to		ļ ^`						
<u> </u>		Was the LCSD RPD within QC limits			<u> </u>	X				
R7	OI	Matrix spike (MS) and matrix spike		V						
			nalytes included in the MS and MSD?	X		<u> </u>	-			
		Were MS/MSD analyzed at the approver Were MS (and MSD, if applicable) %		X	X	<u> </u>	<u> </u>	4		
		Were the MS/MSD RPDs within labor		X	 ^		 	-		
R8	OI	Analytical duplicate data	ratory see minus:							
	- 01	Were appropriate analytical duplicate	es analyzed for each matrix?	X						
		Were analytical duplicates analyzed	,	^	\vdash		 			
			ations within the laboratory QC limits?	+^	Х			4		
R9	OI	Method quantitation limits (MQLs):	·		Ĥ			_		
···•	<u> </u>		te included in the laboratory data package?	Х				I		
			entration of the lowest non-zero calibration	X						
		· · · · · · · · · · · · · · · · · · ·	luded in the laboratory data package?	1	Х			2		
R10	OI	Other problems/anomalies	, ,							
		Are all known problems/anomalies/sp	pecial conditions noted in this LRC and ER?	Х						
		Was applicable and available techno	logy used to lower the SDL to minimize the	Х						
			under the Texas Laboratory Accreditation							
		Program for the analytes, matrices, a	nd methods associated with this laboratory	X			l	3		
		data package?		L	L	L_	L_	<u> </u>		



Laboratory Name:		Accutest Gulf Coast LRC Date:				12/12/2012							
Project Name:		Quarterly Well Sampling, Parker Laboratory Project Number:				TC20875							
Reviewer	Name:	Anita Patel Prep Batch Number(s):					GSS232, VX1673						
#1	A ²	DESCRIPTION						ER#5					
S1	OI	Initial calibration (ICAL)											
			e response factors for each analyte within QC	х									
		limits?		^									
		Were percent RSDs or correlation co	efficient criteria met?	Х									
		Was the number of standards recom-	mended in the method used for all analytes?	Х									
		Were all points generated between th	ne lowest and highest standard used to	Х									
		calculate the curve?											
		Are ICAL data available for all instrun	nents used?	Х									
		Has the initial calibration curve been	verified using an appropriate second source	x									
		standard?		_^									
S2	OI		erification (ICCV AND CCV) and continuing										
		Was the CCV analyzed at the method		Х									
			alyte within the method-required QC limits?	Χ									
		Was the ICAL curve verified for each		Χ									
	_		e concentration in the inorganic CCB <mdl?< th=""><th></th><th></th><th>Х</th><th></th><th></th></mdl?<>			Х							
S3	0	Mass spectral tuning											
		Was the appropriate compound for the		Х									
		Were ion abundance data within the	method-required QC limits?	Х									
S4	0	Internal standards (IS)		Х									
			Were IS area counts and retention times within the method-required QC limits?										
S5	OI	Raw data (NELAC Section 5.5.10)											
		, , , , , , , , , , , , , , , , , , , ,	matograms, spectral data) reviewed by an	Х									
		analyst?	tti fld th d-t2										
		Were data associated with manual in	tegrations flagged on the raw data?	Х	_								
S6	0	Dual column confirmation	most the method required OC2			Х							
S7	0	Did dual column confirmation results meet the method-required QC? Tentatively identified compounds (TICs):				^							
51	-			ı	_								
		If TICs were requested, were the mass spectra and TIC data subject to appropriate checks?				Χ							
S8	1	Interference Check Sample (ICS) r	eculte										
	-	Were percent recoveries within metho				Х							
S9	ı		kes, and method of standard additions			Λ.							
	•		, and the linearity within the QC limits										
		specified in the method?	, and the initiality mains the QC initial			Х							
S10	OI	Method detection limit (MDL) studi	es										
		Was a MDL study performed for each		Х	\neg								
		Is the MDL either adjusted or support		Х				5					
S11	OI	Proficiency test reports											
			ceptable on the applicable proficiency tests or	Х									
		evaluation studies?		_ X									
S12	OI	Standards documentation											
		Are all standards used in the analyse	s NIST-traceable or obtained from other	х									
		appropriate source?		^									
S13	OI	Compound/analyte identification p											
		Are the procedures for compound/and	•	Х									
S14	OI	Demonstration of analyst competency (DOC)											
		Was DOC conducted consistent with NELAC Chapter 5?											
		Is documentation of the analyst's com	, , ,	Х									
S15	OI		ion for methods (NELAC Chapter 5)										
		S .	the data documentated, verified, and	x									
		validated, where applicable?		^									
S16	OI	Laboratory standard operating pro											
		Are laboratory SOPs current and on f	ile for each method performed?	Χ									



	LABORATORY REVIEW CHECKLIST (continued): Exception Reports									
Laboratory	Name:	Accutest Gulf Coast	LRC Date:	12/12/2012						
Project Name:		Quarterly Well Sampling, Parker	Laboratory Project Number:	TC20875						
Reviewer Name:		Anita Patel	Prep Batch Number(s):	GSS232, VX1673						
ER# ¹	Description									
	For reporting	ng purposes, the MQL is defined in the	e report as the RL. The unadjusted MQL/RL is	reported in the method						
1		SDL is defined in the report as the MI								
	For reporting purposes, the method blank represents the unadjusted MQL. The DCS is on file in the laboratory and is not									
2	included in the laboratory data package.									
	The laboratory is NELAC-accredited under the Texas Laboratory Accreditation Program for the analytes, matrices, and									
3		, ,	kage for analytes that are listed in the Texas F	ields of Accreditation.						
4		ies are discussed in the case narrative								
5		tory does not perform DCS analysis for e values in the Texas TRRP PCL table	or Method RSKSOP-147/175. The component	s reported are not listed or						
	uo not navi	e values in the rexas Title T CE table	5 5.							

¹ER# = Exception Report identification number (an Exception Report should be completed for an item if "NR" or "No" is checked on



GC/MS Volatiles

QC Data Summaries

Includes the following where applicable:

- Method Blank Summaries
- Blank Spike Summaries
- Matrix Spike and Duplicate Summaries



Method: SW846 8260B

Method Blank Summary Job Number: TC20875

Job Number:

PESTXST EarthCon Consultants **Account:**

Project: Quarterly Well Sampling, Parker County, Texas

Sample VX1673-MB	File ID X0087062.D	DF 1	Analyzed 12/06/12	By CF	Prep Date n/a	Prep Batch n/a	Analytical Batch VX1673

The QC reported here applies to the following samples:

CAS No.	Compound	Result	RL	MDL	Units Q
71-43-2	Benzene	ND	1.0	0.34	ug/l
100-41-4	Ethylbenzene	ND	1.0	0.32	ug/l
108-88-3	Toluene	ND	1.0	0.33	ug/l
1330-20-7	Xylene (total)	ND	3.0	0.87	ug/l

1868-53-7 Dibromofluoromethane 105% 72-122%	
17060-07-0 1,2-Dichloroethane-D4 95% 68-124% 2037-26-5 Toluene-D8 99% 80-119% 460-00-4 4-Bromofluorobenzene 98% 72-126%	



Method: SW846 8260B

Blank Spike Summary Job Number: TC20875

PESTXST EarthCon Consultants Account:

Quarterly Well Sampling, Parker County, Texas **Project:**

Sample VX1673-BS	File ID X0087060. D	DF 1	Analyzed 12/06/12	By CF	Prep Date n/a	Prep Batch n/a	Analytical Batch VX1673

The QC reported here applies to the following samples:

CAS No.	Compound	Spike ug/l	BSP ug/l	BSP %	Limits
71-43-2	Benzene	25	22.2	89	68-119
100-41-4	Ethylbenzene	25	22.1	88	71-117
108-88-3	Toluene	25	22.4	90	73-119
1330-20-7	Xylene (total)	75	67.7	90	74-119

CAS No.	Surrogate Recoveries	BSP	Limits
1868-53-7	Dibromofluoromethane	101%	72-122%
17060-07-0	1,2-Dichloroethane-D4	99%	68-124%
2037-26-5	Toluene-D8	101%	80-119%
460-00-4	4-Bromofluorobenzene	92%	72-126%



^{* =} Outside of Control Limits.

6.3.1

Page 1 of 1

Method: SW846 8260B

Matrix Spike/Matrix Spike Duplicate Summary

Job Number: TC20875

Account: PESTXST EarthCon Consultants

Project: Quarterly Well Sampling, Parker County, Texas

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
TC20864-1MS	X0087064.D	1	12/06/12	CF	n/a	n/a	VX1673
TC20864-1MSD	X0087065.D	1	12/06/12	CF	n/a	n/a	VX1673
TC20864-1	X0087063.D	1	12/06/12	CF	n/a	n/a	VX1673

The QC reported here applies to the following samples:

CAS No.	Compound	TC20864-1 ug/l Q	Spike ug/l	MS ug/l	MS %	MSD ug/l	MSD %	RPD	Limits Rec/RPD
71-43-2	Benzene	1.0 U	25	23.0	92	22.4	90	3	68-119/12
100-41-4	Ethylbenzene	1.0 U	25	22.7	91	22.4	90	1	71-117/12
108-88-3	Toluene	1.0 U	25	22.9	92	22.5	90	2	73-119/13
1330-20-7	Xylene (total)	3.0 U	75	69.8	93	68.4	91	2	74-119/13

CAS No.	Surrogate Recoveries	MS	MSD	TC20864-1	Limits
1868-53-7	Dibromofluoromethane	103%	101%	105%	72-122%
17060-07-0	1,2-Dichloroethane-D4	98%	98%	96%	68-124%
2037-26-5	Toluene-D8	100%	100%	100%	80-119%
460-00-4	4-Bromofluorobenzene	91%	92%	98%	72-126%



^{* =} Outside of Control Limits.



GC Volatiles

QC Data Summaries

Includes the following where applicable:

- Method Blank Summaries
- Blank Spike Summaries
- Matrix Spike and Duplicate Summaries



Method: RSKSOP-147/175

Method Blank Summary Job Number: TC20875

Job Number:

PESTXST EarthCon Consultants **Account:**

Project: Quarterly Well Sampling, Parker County, Texas

Sample GSS232-MB	File ID SS005026.D	DF 1	Analyzed 12/06/12	By LT	Prep Date n/a	Prep Batch n/a	Analytical Batch GSS232

The QC reported here applies to the following samples:

CAS No.	Compound	Result	RL	MDL	Units Q
74-82-8	Methane	ND	0.50	0.30	ug/l
74-85-1	Ethene	ND	1.0	0.50	ug/l
74-84-0	Ethane	ND	1.0	0.50	ug/l
74-98-6	Propane	ND	1.5	0.75	ug/l
75-28-5	Isobutane	ND	1.5	0.75	ug/l
106-97-8	Butane	ND	1.5	0.75	ug/l



Method: RSKSOP-147/175

Blank Spike Summary Job Number: TC20875

Account: PESTXST EarthCon Consultants

Quarterly Well Sampling, Parker County, Texas **Project:**

Sample GSS232-BS	File ID SS005023.D	Analyzed 12/06/12	By LT	Prep Date n/a	Prep Batch n/a	Analytical Batch GSS232

The QC reported here applies to the following samples:

CAS No.	Compound		Spike ug/l	BSP ug/l	BSP %	Limits
74-82-8	Methane	2	21.5	21.0	98	68-139
74-85-1	Ethene	4	57.4	54.7	95	52-145
74-84-0	Ethane	4	43.3	56.7	131	68-131
74-98-6	Propane	(60.6	68.2	113	69-131
75-28-5	Isobutane	7	72.5	77.3	107	72-131
106-97-8	Butane	2	76.6	82.4	108	66-128



^{* =} Outside of Control Limits.

Method: RSKSOP-147/175

Job Number: TC20875

Account: PESTXST EarthCon Consultants

Project: Quarterly Well Sampling, Parker County, Texas

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
TC20890-1MS	SS005029.D	1	12/06/12	LT	n/a	n/a	GSS232
TC20890-1	SS005027.D	1	12/06/12	LT	n/a	n/a	GSS232
TC20890-1	SS005030.D	250	12/06/12	LT	n/a	n/a	GSS232

The QC reported here applies to the following samples:

TC20875-1

CAS No.	Compound	TC20890-1 ug/l Q	Spike ug/l	MS ug/l	MS %	Limits
74-82-8	Methane	20100 b	21.5	17100	-13815*	∗ 0 8-139
74-85-1	Ethene	1.0 U	57.4	5540	9654*	52-145
74-84-0	Ethane	3500 b	43.3	4120	1431* a	68-131
74-98-6	Propane	66.8	60.6	172	174*	69-131
75-28-5	Isobutane	8.41	72.5	93.3	117	72-131
106-97-8	Butane	10.3	76.6	101	119	66-128

(a) Outside control limits due to high level in sample relative to spike amount.

(b) Result is from Run #2.



^{* =} Outside of Control Limits.

Method: RSKSOP-147/175

Duplicate Summary Job Number: TC20875

PESTXST EarthCon Consultants Account:

Project: Quarterly Well Sampling, Parker County, Texas

Sample	File ID	DF	Analyzed	Ву	Prep Date	Prep Batch	Analytical Batch
TC20890-1DUP	SS005028.D	1	12/06/12	LT	n/a	n/a	GSS232
TC20890-1	SS005027.D	1	12/06/12	LT	n/a	n/a	GSS232
TC20890-1	SS005030.D	250	12/06/12	LT	n/a	n/a	GSS232

The QC reported here applies to the following samples:

TC20875-1

CAS No.	Compound	TC20890-1 ug/l Q	DUP ug/l	Q	RPD	Limits
74-82-8	Methane	20100 a	16400	E	21	53
74-85-1	Ethene	1.0 U	ND		nc	27
74-84-0	Ethane	3500 a	4020	E	14	43
74-98-6	Propane	66.8	99.1		39*	21
75-28-5	Isobutane	8.41	12.1		36*	35
106-97-8	Butane	10.3	15.1		38*	33

(a) Result is from Run #2.



^{* =} Outside of Control Limits.



ANALYSIS REPORT

Lab #: 321083 Job #: 20030

Sample Name/Number: WW20-HUF-120112
Company: Oil Tracers, LLC

Date Sampled: 12/01/2012

Container: Dissolved Gas Bottle

Field/Site Name: Third Quarter Well Sampling

Location: Parker County, Texas

Formation/Depth:

Sampling Point:

Date Received: 12/05/2012 Date Reported: 2/01/2013

Component	Chemical mol. %	δ ¹³ C ‰	δD ‰	δ ¹⁸ Ο ‰
Carbon Monoxide	nd			
Hydrogen Sulfide	na			
Helium	na			
Hydrogen	nd			
Argon	1.56			
Oxygen	0.11			
Nitrogen	87.87			
Carbon Dioxide	0.14			
Methane	10.28	-44.67	-117.8	
Ethane	0.0320			
Ethylene	nd			
Propane	nd			
Propylene	nd			
Iso-butane	nd			
N-butane	0.0078			
Iso-pentane	nd			
N-pentane	nd			
Hexanes +	nd			

Remarks:

Analysis is of gas extracted from water by headspace equilibration. Analysis has been corrected for helium added to create headspace. Helium dilution factor = 0.75

nd = not detected. na = not analyzed. Isotopic composition of hydrogen is relative to VSMOW. Isotopic composition of carbon is relative to VPDB. Isotopic composition of oxygen is relative to VSMOW, except for carbon dioxide which is relative to VPDB. Calculations for BTU and specific gravity per ASTM D3588. Chemical compositions are normalized to 100%. Mol. % is approximately equal to vol. %.

^{*}Addition of helium negates the ability to detect native helium and may negate the ability to detect hydrogen.



12/12/12



Technical Report for

EarthCon Consultants

Quarterly Well Sampling, Parker County, Texas

3rd Quarter / WW14A-Hur

Accutest Job Number: TC20883

Sampling Date: 12/02/12

Report to:

EarthCon Consultants 4800 Sugar Grove Suite 420 Stafford, TX 77477

gfloreslovo@earthcon.com; djackson@jacksonsjoberg.com; mcpatton@rangeresources.com; escott@earthcon.com

ATTN: Gabriela Floreslovo

Total number of pages in report: 30



Test results contained within this data package meet the requirements of the National Environmental Laboratory Accreditation Conference and/or state specific certification programs as applicable.

Richard Rollriguez Laboratory Director

Client Service contact: Elessa Sommers 713-271-4700

Certifications: TX (T104704220-12-8) AR (11-028-0) AZ (AZ0769) FL (E87628) KS (E-10366) LA (85695/04004) OK (211-035)

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Sample Summary

EarthCon Consultants

Job No: TC20883

Quarterly Well Sampling, Parker County, Texas Project No: 3rd Quarter / WW14A-Hur

Sample	Collected			Matr	ix	Client
Number	Date	Time By	Received	Code	Type	Sample ID
TC20883-1	12/02/12	10:47	12/04/12	AQ	Ground Water	WW14A-HUR-120212





SAMPLE DELIVERY GROUP CASE NARRATIVE

Client: EarthCon Consultants Job No TC20883

Site: Quarterly Well Sampling, Parker County, Texas Report Date 12/12/2012 1:50:13 PM

1 Sample was collected on 12/02/2012 and received intact at Accutest on 12/04/2012 and properly preserved in 1 cooler at 2.4 Deg C. The sample received an Accutest job number of TC20883. A listing of the Laboratory Sample ID, Client Sample ID and date of collection are presented in the Results Summary Section of this report.

Except as noted below, all method specified calibrations and quality control performance criteria were met for this job. For more information, please refer to QC summary pages.

Volatiles by GCMS By Method SW846 8260B

Matrix AO Batch ID: VK578

- All samples were analyzed within the recommended method holding time.
- All method blanks for this batch meet method specific criteria.
- Sample(s) TC20506-1MS, TC20506-1MSD were used as the QC samples indicated.

Volatiles by GC By Method RSKSOP-147/175

Matrix AQ Batch ID: GSS233

- All samples were analyzed within the recommended method holding time.
- All method blanks for this batch meet method specific criteria.
- Sample(s) TC20879-1DUP, TC20970-2MS were used as the QC samples indicated.
- TC20970-2MS: Sample was not preserved to a pH < 2.

Matrix AQ Batch ID: GSS234

- All samples were analyzed within the recommended method holding time.
- All method blanks for this batch meet method specific criteria.
- Sample(s) TC21021-1DUP, TC21021-2MS were used as the QC samples indicated.

Accutest Laboratories Gulf Coast (ALGC) certifies that this report meets the project requirements for analytical data produced for the samples as received at ALGC and as stated on the COC. ALGC certifies that the data meets the Data QualityObjectives for precision, accuracy and completeness as specified in the ALGC Quality Manual except as noted above. This report is to be used in its entirety. ALGC is not responsible for any assumptions of data quality if partial data packages are used

Summary of Hits Job Number: TC20883

Account: EarthCon Consultants

Quarterly Well Sampling, Parker County, Texas 12/02/12**Project:**

Collected:

Lab Sample ID Analyte	Client Sample ID	Result/ Qual	MQL	SDL	Units	Method
TC20883-1	WW14A-HUR-120	0212				
Methane Ethane		0.699 0.0705	0.0050 0.0010	0.0030 0.00050	mg/l mg/l	RSKSOP-147/175 RSKSOP-147/175



Sample Results	
Report of Analysis	



4

Report of Analysis

Client Sample ID: WW14A-HUR-120212

 Lab Sample ID:
 TC20883-1
 Date Sampled:
 12/02/12

 Matrix:
 AQ - Ground Water
 Date Received:
 12/04/12

 Method:
 SW846 8260B
 Percent Solids:
 n/a

Project: Quarterly Well Sampling, Parker County, Texas

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	K13197.D	1	12/06/12	EM	n/a	n/a	VK578
Run #2							

	Purge Volume	
Run #1	5.0 ml	
Run #2		

Purgeable Aromatics

CAS No.	Compound	Result	MQL	SDL	Units	Q
71-43-2 108-88-3 100-41-4 1330-20-7	Benzene Toluene Ethylbenzene Xylene (total)	0.00034 U 0.00033 U 0.00032 U 0.00087 U	0.0010 0.0010 0.0010 0.0030	0.00034 0.00033 0.00032 0.00087	mg/l mg/l mg/l mg/l	
CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits		
1868-53-7 17060-07-0 2037-26-5 460-00-4	Dibromofluoromethane 1,2-Dichloroethane-D4 Toluene-D8 4-Bromofluorobenzene	111% 108% 105% 105%		72-122% 68-124% 80-119% 72-126%		

 $\begin{array}{ll} U = & Not \; detected & SDL \; - \; Sample \; Detection \; Limit \\ MQL = & Method \; Quantitation \; Limit \end{array}$

 $E = \ Indicates \ value \ exceeds \ calibration \ range$

J = Indicates an estimated value

B = Indicates analyte found in associated method blank N = Indicates presumptive evidence of a compound



Report of Analysis

Client Sample ID: WW14A-HUR-120212

 Lab Sample ID:
 TC20883-1
 Date Sampled:
 12/02/12

 Matrix:
 AQ - Ground Water
 Date Received:
 12/04/12

 Method:
 RSKSOP-147/175
 Percent Solids:
 n/a

Project: Quarterly Well Sampling, Parker County, Texas

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	SS005076.D	1	12/07/12	LT	n/a	n/a	GSS233
Run #2	SS005100.D	10	12/10/12	LT	n/a	n/a	GSS234

RSK147 Special List

CAS No.	Compound	Result	MQL	SDL	Units	Q
74-82-8	Methane	0.699 a	0.0050	0.0030	mg/l	
74-85-1	Ethene	0.00050 U	0.0010	0.00050	mg/l	
74-84-0	Ethane	0.0705	0.0010	0.00050	mg/l	
74-98-6	Propane	0.00075 U	0.0015	0.00075	mg/l	
75-28-5	Isobutane	0.00075 U	0.0015	0.00075	mg/l	
106-97-8	Butane	0.00075 U	0.0015	0.00075	mg/l	

(a) Result is from Run# 2

U = Not detected

SDL - Sample Detection Limit

 $MQL = \ Method \ Quantitation \ Limit$

E = Indicates value exceeds calibration range

J = Indicates an estimated value

B = Indicates analyte found in associated method blank N = Indicates presumptive evidence of a compound





Misc. Forms

Custody Documents and Other Forms

Includes the following where applicable:

- Chain of Custody
- LRC Form



CHAIN OF CUSTODY

	AC	engy greens			Energy Service		T de
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EACCUTE	Carry Marie													F	FED-EX Tracking #			T	Bottle Order Control #							
Laborati	ories			10165 Harv TEL. 713											Accutest Quote #			-	Accutest Job#			Q S S				
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Client / Reporting	nformation			Project I	nformat	ion	100										!	₹e q	uest	ed .	Anal	yses	s	-г	-	Matrix Codes
	590000000000000000000000000000000000000	Project Name:												1		ایا			- 1	- 1		1				
Company Name		Third Overtor	ly Well Sampli	ng Parker C	ounty T	exas										Ethene, Isobutane, Methane,								- 1		DW - Drinking Water
EarthCon Consultants, Inc. Street Address		Street	y wen sampin	ily, raikei C				CHA	3601							t le		- 1								GW - Ground Water WW - Water
4800 Sugar Grove Blvd., Su	ita 200				Billing In	formatio	n (if	differe	ent fr	om Re	port	to)				, N							1			SW - Surface Water
City State	Zip	City		State	Company	Name										tan										SO - Soil SL- Sludge
Stafford TX	77477															pp										SED-Sediment OI - Oil
Project Contact	E-mail	Project #			Street Ad	dress										<u>s</u>										LIQ - Other Liquid
Gabriela Floreslovo					City				-	State			Zip			e e										AIR - Air SOL - Other Solid
Phone #	Fax#	Client Purchase 0	Order#		City											温さ										WP - Wipe
281-201-3513	Disease #	Project Manager			Attention	-									1	SK a						1 1				FB-Field Blank
Sampler(s) Name(s)	Phone #	F TOJECT WATING													8	£ 5										i Ì
JB, 5 H, RM		+	Colle	ction					Numb	er of po	eserv	ed Bottle	es		82	e, E										
1 1						# of		표		۳ ا	ater	Į.	804	8 8	BTEX 8260B	Butane, Ethane, E										
Accutest Sample# Field ID / F	oint of Collection	Date	Time	Sampled By	Matrix	bottles	豆	ZANa	HNO3	HZSO NONE	DI Wa	MEOH TSP	E Z	OTHER	E	<u> </u>										LAB USE ONLY
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Turnaround Time	(Business days)				(II) (III) (II)	er er er er er er er er er er er er er e			_		e Inf	ormati			10000		1		1980020	S COI	mnence	/ Spec	idi IIISu	uctions	TESCS-N/T	SECURCING COLORS
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4 Day RUSH 3 Day RUSH					ᅵ片	REDT1						_														
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1 Day EMERGENC	•											sults O					\vdash									
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	17-6	1-12 012 s	ample Custody	must be docu	mented 1	below e	ach t	ime s	ampl	les ch	ange	e poss	sessio	on, in	cludin	g couri	er deliv	ery.			10000				(desire	
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5			5												- Noti	niáci										

TC20883: Chain of Custody Page 1 of 4







Accutest Laboratories Sample Receipt Summary

Accutest Job Number: TC2	0883	Client:	EARTHCO	N CON	SULTANT	S	Project:	3RD QTR WEL	L SAMPLI	NG,PARK	ER COUNTY,T
Date / Time Received: 12/4	/2012		Delivery M	ethod:		Client	Airbill #'s:				
No. Coolers: 1	Therm ID:	IR6					Temp Adjus	tment Factor:	0.2		
Cooler Temps (Initial/Adjuste	ed): #1: (2.2	(2.4)									
Cooler Security Y	or N			Υo	r N_	Sample Integr	ity - Documer	ntation_	Υ_	or N	
Custody Seals Present:	_	3. COC P		✓		1. Sample labels	s present on bo	ttles:	✓		
2. Custody Seals Intact: ✓	<u> </u>	Smpl Date	s/Time OK	✓		2. Container lab	eling complete:		✓		
Cooler Temperature	Y or N	_				3. Sample conta	ainer label / CO	C agree:	✓		
1. Temp criteria achieved:	v]				Sample Integr	rity - Conditio	on	Υ	or N	
Cooler temp verification:	Infared G	un				Sample recvo	d within HT:	_	✓		
Cooler media:	Ice (bag	1)				2. All containers	s accounted for:		~		
Quality Control Preservation	n Y or I	N/A	<u>. 1</u>	WTB	STB	3. Condition of s	sample:			Intact	
1. Trip Blank present / cooler:	V			✓		Sample Integr	rity - Instructi	ons	Υ	or N	N/A
2. Trip Blank listed on COC:] 🗆				Analysis requ			<u> </u>		
3. Samples preserved properly:	v]					ived for unspeci	fied tests		✓	
4. VOCs headspace free:	v					3. Sufficient vol	lume recvd for a	analysis:	✓		
						4. Compositing	instructions cle	ar:			✓
						5. Filtering instr	ructions clear:				~
Comments -Received trip blank	not listed on (COC.									

TC20883: Chain of Custody Page 2 of 4





Problem Resolution

Accutest Job Number: TC20883

CSR: Elessa Sommers Response Date: 12/5/2012

Response: Trip blank is on separate report.

7

TC20883: Chain of Custody Page 3 of 4







Sample Receipt Log

 Job #:
 TC20883
 Date / Time Received:
 12/4/2012 9:22:00 AM
 Initials:
 CH

Client: EARTHCON CONSULTANTS

Cooler #	Sample ID:	Vol	Bot #	Location	Pres	рН	Therm ID	Initial Temp	Therm CF	Corrected Temp
1	TC20883-1	40ml	1	VR	HCL	Note #1 - Preservative to be checked by analyst at the instrument.	IR6	2.2	0.2	2.4
1	TC20883-1	40ml	2	VR	HCL	Note #1 - Preservative to be checked by analyst at the instrument.	IR6	2.2	0.2	2.4
1	TC20883-1	40ml	3	VR	HCL	Note #1 - Preservative to be checked by analyst at the instrument.	IR6	2.2	0.2	2.4
1	TC20883-1	40ml	4	VR	HCL	Note #1 - Preservative to be checked by analyst at the instrument.	IR6	2.2	0.2	2.4
1	TC20883-1	40ml	5	VR	HCL	Note #1 - Preservative to be checked by analyst at the instrument.	IR6	2.2	0.2	2.4
1	TC20883-1	40ml	6	VR	HCL	Note #1 - Preservative to be checked by analyst at the instrument.	IR6	2.2	0.2	2.4

TC20883: Chain of Custody

Page 4 of 4



Laboratory Data Package Cover Page Appendix A

This signature page, the laboratory review checklist, and the following reportable data:

TC20883 This data package consists of

QA Manager Name (Printed)

Richard Rodriguez

Signature

ė	R1	Field chain-of-custody docume	entation;
	R2	Sample identification cross-ref	ference;
Ģ	R3	Test reports (analytical data sh	neets) for each environmental sample that includes:
		a)	Items consistent with NELAC 5.13 or ISO/IEC 17025 Section 5.10
		b)	dilution factors,
		c)	preparation methods,
		d)	cleanup methods, and
		e)	if required for the project, tentatively identified compounds (TICs).
	R4	Surrogate recovery data include	ding:
		a)	Calculated recovery (%R), and
		b)	The laboratory's surrogate QC limits.
	R5	Test reports/summary forms for	or blank samples;
	R6	Test reports/summary forms for	or laboratory control samples (LCSs) including:
		a)	LCS spiking amounts,
		b)	Calculated %R for each analyte, and
		c)	The laboratory's LCS QC limits.
	R7	Test reports for project matrix:	spike/matrix spike duplicates (MS/MSDs) including:
		a)	Samples associated with the MS/MSD clearly identified,
		b)	MS/MSD spiking amounts,
		c)	Concentration of each MS/MSD analyte measured in the parent and
		d)	Calculated %Rs and relative percent differences (RPDs), and
		e)	The laboratory's MS/MSD QC limits
	R8	Laboratory analytical duplicate	e (if applicable) recovery and precision:
		a)	The amount of analyte measured in the duplicate,
		b)	The calculated RPD, and
		c)	The laboratory's QC limits for analytical duplicates.
Ģ	R9		its (MQLs) and detectability check sample results for each analyte for each
Ģ	R10	Other problems or anomalies.	
			d (NR)" item in Laboratory Review Checklist and for each analyte, matrix, and
method fo	or which the	laboratory does not hold NELAC	Caccreditation under the Texas Laboratory Accreditation Program.
Release	Statement:	I am responsible for the release	e of this laboratory data package. This laboratory is NELAC accredited under the
Texas Lal	ooratory Acc	creditation Program for all the me	ethods, analytes, and matrices reported in this data package except as noted in
the Excep	tion Report	. This data package has been re	eviewed by the laboratory and is complete and technically compliant with the
requireme	ents of the m	nethods used, except where note	ed by the laboratory in the attached exception reports. By my signature below, I
affirm to the	ne best of m	ny knowledge, all problems/anon	nalies, observed by the laboratory as having the potential to affect the quality of
the data, I	nave been i	dentified by the laboratory in the	Laboratory Review Checklist, and no information or data have been knowingly
withheld.			
	applicable	•	ption under 30 TAC&25.6 and was last inspection by
[]			April 2011. Any findings affecting the data in this laboratory data package are
			s herein. The official signing the cover page of the report in which these data are
		used is responsible for releasing	ng this data package and is by signature affirming the above release statement

Official Title (printed)

Laboratory Director

Date 12/12/2012



	L	ABORATORY REVIEW CHECKLIST: REPORTABLE	DAT	Ά			
Laboratory	Name:	Accutest Gulf Coast LRC Date:	12	/12/2	012		
		Quarterly Well Sampling, Parker					
Project Na		County, Texas Laboratory Project Number:	_	2088			
Reviewer	Name:	Anita Patel Prep Batch Number(s):			VK5		5
#1	A ²	DESCRIPTION	YES	NO	NA°	NR.	ER# ⁵
R1	OI	CHAIN-OF-CUSTODY (C-O-C):					
		Did samples meet the laboratory's standard conditions of sample acceptability	Х				i
		upon receipt? Were all departures from standard conditions described in an exception report?	X				
R2	OI	Sample and quality control (QC) identification	 ^				
- 1\2	<u> </u>	Are all field sample ID numbers cross-referenced to the laboratory ID numbers?	Х				
		Are all laboratory ID numbers cross-referenced to the corresponding QC data?	^				
	01		 ^				
R3	OI	Test reports Were samples prepared and analyzed within holding times?	V				
		Other than those results <mql, all="" bracketed="" by="" calibration<="" other="" raw="" td="" values="" were=""><td>X</td><td></td><td></td><td></td><td></td></mql,>	X				
		standards?	Х				1
		Were calculations checked by a peer or supervisor?	X				
		Were all analyte identifications checked by a peer or supervisor?	X	\vdash			
		Were sample detection limits reported for all analytes not detected?	X				
		Were all results for soil and sediment samples reported on a dry weight basis?	 ^	\vdash	Х		
		Were % moisture (or solids) reported for all soil and sediment samples?	t		X		
		Were bulk soils/solids samples for volatile analysis extracted with methanol per					
		SW846 Method 5035?			Х		
		If required for the project, are TIC's reported?			Х		
R4	0	Surrogate recovery data					
		Were surrogates added prior to extraction?	Х				
		Were surrogate percent recoveries in all samples within the laboratory QC limits?	X				
R5	OI	Test reports/summary forms for blank samples					
		Were appropriate type(s) of blanks analyzed?	X				
		Were blanks analyzed at the appropriate frequency?	X				
		Were method blanks taken through the entire analytical process, including	Х				i
		preparation and, if applicable, cleanup procedures? Were blank concentrations <mql?< td=""><td>X</td><td></td><td></td><td></td><td></td></mql?<>	X				
R6	OI	Laboratory control samples (LCS):	<u> </u>				
	<u> </u>	Were all COCs included in the LCS?	Х	П			
		Was each LCS taken through the entire analytical procedure, including prep and					
		cleanup steps?	X				1
		Were LCSs analyzed at required frequency?	Х				
		Were LCS (and LCSD, if applicable) %Rs within the laboratory QC limits?	Х				
		Does the detectablility check sample data document the laboratory's capability to	Х				4
		detect the COCs at the MDL used to calculate the SDLs?	^				*
		Was the LCSD RPD within QC limits?		L	Х		
R7	OI	Matrix spike (MS) and matrix spike duplicate (MSD) data					
		Were the project/method specified analytes included in the MS and MSD?	X	<u> </u>			
		Were MS/MSD analyzed at the appropriate frequency?	X	_			
		Were MS (and MSD, if applicable) %Rs within the laboratory QC Limits? Were the MS/MSD RPDs within laboratory QC limits?	X	\vdash	_		
R8	OI	,					
- 10	UI UI	Analytical duplicate data Were appropriate analytical duplicates analyzed for each matrix?	Х				
		Were analytical duplicates analyzed for each matrix? Were analytical duplicates analyzed at the appropriate frequency?	X	_			
		Were RPDs or relative standard deviations within the laboratory QC limits?	l â				
R9	OI	Method quantitation limits (MQLs):	+^	_			
11.3	ļ ,	Are the MQLs for each method analyte included in the laboratory data package?	Х				
		Do the MQLs correspond to the concentration of the lowest non-zero calibration	X	\vdash			
		Are unadjusted MQLs and DCSs included in the laboratory data package?	 ^	Х			2
R10	OI	Other problems/anomalies					_
		Are all known problems/anomalies/special conditions noted in this LRC and ER?	Х				
		Was applicable and available technology used to lower the SDL to minimize the	Х				
		Is the laboratory NELAC-accredited under the Texas Laboratory Accreditation					
		Program for the analytes, matrices, and methods associated with this laboratory	X				3
	<u></u>	data package?	L	L			
· · · · · · · · · · · · · · · · · · ·				_	_	_	_



Laboratory	Name:	Accutest Gulf Coast	LRC Date:	12/12/2012						
Project Na		Quarterly Well Sampling, Parker		TC20883						
Reviewer	Name:	Anita Patel	Prep Batch Number(s):	_		VK57	78			
#1	A ²	DESCRIPTION	1. 10p 2aton 11am201(0).				NR ⁴	FR #		
S1	OI	Initial calibration (ICAL)		120	110	,				
	<u> </u>		e response factors for each analyte within QC		l		П			
		limits?	response factors for each analyte within Qo	X						
		Were percent RSDs or correlation co	efficient criteria met?	X						
			mended in the method used for all analytes?	T X						
			ne lowest and highest standard used to							
		calculate the curve?	io ionost and ingriost standard dood to	X						
		Are ICAL data available for all instrum	nents used?	X						
			verified using an appropriate second source							
		standard?	vermed daming an appropriate accord addrec	X						
S2	OI		erification (ICCV AND CCV) and continuing							
- 02	- 0.	Was the CCV analyzed at the method		Х	_		П			
			alyte within the method-required QC limits?	X						
		Was the ICAL curve verified for each	·	X			+			
			e concentration in the inorganic CCB <mdl?< td=""><td>+^</td><td></td><td>Х</td><td>+</td><td></td></mdl?<>	+^		Х	+			
S3	0	Mass spectral tuning	concentration in the morganic CCB <mdl?< td=""><td></td><td></td><td></td><td></td><td></td></mdl?<>							
- 33	0		no mothed used for tuning?	V						
		Was the appropriate compound for the Were ion abundance data within the		X		-	\vdash			
S4	0	Internal standards (IS)	memou-required QC inflits?	 ^						
- 54	0	` '		V	1					
	OI		nes within the method-required QC limits?	X						
S5	OI	Raw data (NELAC Section 5.5.10)								
		` '	matograms, spectral data) reviewed by an	X						
		analyst?		ļ.,						
		Were data associated with manual in	tegrations flagged on the raw data?	X						
S6	0	Dual column confirmation					_			
		Did dual column confirmation results	<u>'</u>			Х				
S7	0	Tentatively identified compounds								
			s spectra and TIC data subject to appropriate			Х				
		checks?								
S8	ı	Interference Check Sample (ICS) r					_			
		Were percent recoveries within method				Х				
S9	ı		kes, and method of standard additions							
		1	, and the linearity within the QC limits			Х				
		specified in the method?					Щ			
S10	OI	Method detection limit (MDL) studi								
		Was a MDL study performed for each		X						
	L	Is the MDL either adjusted or support	ed by the analysis of DCSs?	Х			ш	4		
S11	OI	Proficiency test reports								
			ceptable on the applicable proficiency tests or	Ιx		1				
		evaluation studies?		<u> </u>						
S12	OI	Standards documentation								
		•	s NIST-traceable or obtained from other	Ιx		1				
		appropriate source?		<u> </u>			$\sqcup \bot$			
S13	OI	Compound/analyte identification p								
		Are the procedures for compound/and		X						
S14	OI	Demonstration of analyst compete								
		Was DOC conducted consistent with	X							
		Is documentation of the analyst's com	Х							
S15	OI	Verification/validation documentat								
		Are all the methods used to generate	the data documentated, verified, and	Х						
		validated, where applicable?		L^	L	<u></u>	\Box			
S16	OI	Laboratory standard operating pro								
		Are laboratory SOPs current and on f	ile for each method performed?	Х						



	LABOF	RATORY REVIEW CHEC	KLIST (continued): Exception	n Reports							
Laboratory	Name:	Accutest Gulf Coast	LRC Date:	12/12/2012							
Project Na	me:	Quarterly Well Sampling, Parker	Laboratory Project Number:	TC20883							
Reviewer	Name:	Anita Patel	Prep Batch Number(s):	GSS233, VK578							
ER# ¹	Description										
1	blank. The	SDL is defined in the report as the MI		'							
2	For reporting purposes, the method blank represents the unadjusted MQL. The DCS is on file in the laboratory and is not included in the laboratory data package.										
3			exas Laboratory Accreditation Program for the kage for analytes that are listed in the Texas F								
4		tory does not perform DCS analysis for e values in the Texas TRRP PCL table	or Method RSKSOP-147/175. The component es.	s reported are not listed or							

1ER# = Exception Report identification number (an Exception Report should be completed for an item if "NR" or "No" is checked on



GC/MS Volatiles

QC Data Summaries

Includes the following where applicable:

- Method Blank Summaries
- Blank Spike Summaries
- Matrix Spike and Duplicate Summaries



Method: SW846 8260B

Method Blank Summary Job Number: TC20883

PESTXST EarthCon Consultants **Account:**

Project: Quarterly Well Sampling, Parker County, Texas

Sample	File ID	DF	Analyzed 12/06/12	By	Prep Date	Prep Batch	Analytical Batch
VK578-MB	K13177.D	1		EM	n/a	n/a	VK578

The QC reported here applies to the following samples:

CAS No.	Compound	Result	RL	MDL	Units Q
71-43-2	Benzene	ND	1.0	0.34	ug/l
100-41-4	Ethylbenzene	ND	1.0	0.32	ug/l
108-88-3	Toluene	ND	1.0	0.33	ug/l
1330-20-7	Xylene (total)	ND	3.0	0.87	ug/l

CAS No.	Surrogate Recoveries	Limits	
1868-53-7	Dibromofluoromethane	107%	72-122%
17060-07-0	1,2-Dichloroethane-D4	105%	68-124%
2037-26-5	Toluene-D8	107%	80-119%
460-00-4	4-Bromofluorobenzene	103%	72-126%



Method: SW846 8260B

Blank Spike Summary Job Number: TC20883

PESTXST EarthCon Consultants Account:

Quarterly Well Sampling, Parker County, Texas **Project:**

Sample	File ID	DF	Analyzed	Ву	Prep Date	Prep Batch	Analytical Batch
VK578-BS	K13175.D	1	12/06/12	EM	n/a	n/a	VK578

The QC reported here applies to the following samples:

CAS No.	Compound	Spike ug/l	BSP ug/l	BSP %	Limits
71-43-2	Benzene	25	23.5	94	68-119
100-41-4	Ethylbenzene	25	23.4	94	71-117
108-88-3	Toluene	25	23.0	92	73-119
1330-20-7	Xylene (total)	75	71.7	96	74-119

CAS No.	Surrogate Recoveries	BSP	Limits
1868-53-7	Dibromofluoromethane	105%	72-122%
17060-07-0	1,2-Dichloroethane-D4	103%	68-124%
2037-26-5	Toluene-D8	105%	80-119%
460-00-4	4-Bromofluorobenzene	101%	72-126%



^{* =} Outside of Control Limits.

6.3.1

Page 1 of 1

Method: SW846 8260B

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Matrix Spike/Matrix Spike Duplicate Summary

Job Number: TC20883

Account: PESTXST EarthCon Consultants

Project: Quarterly Well Sampling, Parker County, Texas

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
TC20506-1MS	K13179.D	1	12/06/12	EM	n/a	n/a	VK578
TC20506-1MSD	K13180.D	1	12/06/12	EM	n/a	n/a	VK578
TC20506-1	K13178.D	1	12/06/12	EM	n/a	n/a	VK578

The QC reported here applies to the following samples:

CAS No.	Compound	TC20506-1 ug/l Q	Spike ug/l	MS ug/l	MS %	MSD ug/l	MSD %	RPD	Limits Rec/RPD
71-43-2	Benzene	ND	25	23.4	94	23.1	92	1	68-119/12
100-41-4	Ethylbenzene	ND	25	22.9	92	22.6	90	1	71-117/12
108-88-3	Toluene	ND	25	23.0	92	22.1	88	4	73-119/13
1330-20-7	Xylene (total)	ND	75	71.6	95	69.3	92	3	74-119/13

CAS No.	Surrogate Recoveries	MS	MSD	TC20506-1	Limits
1868-53-7	Dibromofluoromethane	108%	108%	105%	72-122%
17060-07-0	1,2-Dichloroethane-D4	103%	105%	104%	68-124%
2037-26-5	Toluene-D8	107%	105%	106%	80-119%
460-00-4	4-Bromofluorobenzene	103%	104%	104%	72-126%



^{* =} Outside of Control Limits.



GC Volatiles

QC Data Summaries

Includes the following where applicable:

- Method Blank Summaries
- Blank Spike Summaries
- Matrix Spike and Duplicate Summaries



Method: RSKSOP-147/175

Method Blank Summary Job Number: TC20883

Account: PESTXST EarthCon Consultants

Quarterly Well Sampling, Parker County, Texas **Project:**

Sample GSS233-MB	File ID SS005056.D	DF 1	Analyzed 12/07/12	By LT	Prep Date n/a	Prep Batch n/a	Analytical Batch GSS233

The QC reported here applies to the following samples:

CAS No.	Compound	Result	RL	MDL	Units Q
74-85-1	Ethene	ND	1.0	0.50	ug/l
74-84-0	Ethane	ND	1.0	0.50	ug/l
74-98-6	Propane	ND	1.5	0.75	ug/l
75-28-5	Isobutane	ND	1.5	0.75	ug/l
106-97-8	Butane	ND	1.5	0.75	ug/l



Method Blank Summary Job Number: TC20883

Account: PESTXST EarthCon Consultants

Quarterly Well Sampling, Parker County, Texas **Project:**

Sample GSS234-MB	File ID SS005099.D	DF 1	Analyzed 12/10/12	By LT	Prep Date n/a	Prep Batch n/a	Analytical Batch GSS234

The QC reported here applies to the following samples: Method: RSKSOP-147/175

CAS No.	Compound	Result	RL	MDL	Units Q
74-82-8	Methane	ND	0.50	0.30	ug/l



Method: RSKSOP-147/175

Blank Spike Summary Job Number: TC20883

Account: PESTXST EarthCon Consultants

Quarterly Well Sampling, Parker County, Texas **Project:**

Sample GSS233-BS	File ID SS005054.D	DF 1	Analyzed 12/07/12	By LT	Prep Date n/a	Prep Batch n/a	Analytical Batch GSS233

The QC reported here applies to the following samples:

CAS No.	Compound	Spike ug/l	BSP ug/l	BSP %	Limits
74-85-1	Ethene	57.4	43.2	75	52-145
74-84-0	Ethane	43.3	47.1	109	68-131
74-98-6	Propane	60.6	60.5	100	69-131
75-28-5	Isobutane	72.5	70.4	97	72-131
106-97-8	Butane	76.6	73.6	96	66-128



^{* =} Outside of Control Limits.

Blank Spike Summary Job Number: TC20883

Account: PESTXST EarthCon Consultants

Quarterly Well Sampling, Parker County, Texas **Project:**

Sample	File ID	DF	Analyzed 12/10/12	By	Prep Date	Prep Batch	Analytical Batch
GSS234-BS	SS005096.D	1		LT	n/a	n/a	GSS234

The QC reported here applies to the following samples: Method: RSKSOP-147/175

CAS No.	Compound	Spike ug/l	BSP ug/l	BSP %	Limits
74-82-8	Methane	21.5	20.9	97	68-139



^{* =} Outside of Control Limits.

Method: RSKSOP-147/175

Matrix Spike Summary Job Number: TC20883

PESTXST EarthCon Consultants Account:

Quarterly Well Sampling, Parker County, Texas **Project:**

Sample TC20970-2MS ^a TC20970-2 ^a	File ID SS005067.D SS005066.D	Analyzed 12/07/12 12/07/12	By LT LT	Prep Date n/a n/a	Prep Batch n/a n/a	Analytical Batch GSS233 GSS233

The QC reported here applies to the following samples:

TC20883-1

CAS No.	Compound	TC20970-2 ug/l Q	Spike ug/l	MS ug/l	MS %	Limits
74-85-1	Ethene	ND	57.4	46.6	81	52-145
74-84-0	Ethane	4.71	43.3	46.7	97	68-131
74-98-6	Propane	ND	60.6	53.4	88	69-131
75-28-5	Isobutane	ND	72.5	61.8	85	72-131
106-97-8	Butane	ND	76.6	66.0	86	66-128

(a) Sample was not preserved to a pH < 2.



^{* =} Outside of Control Limits.

Matrix Spike Summary Job Number: TC20883

Account: PESTXST EarthCon Consultants

Project: Quarterly Well Sampling, Parker County, Texas

Sample	File ID	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
TC21021-2MS	SS005113.D	12/10/12	LT	n/a	n/a	GSS234
TC21021-2	SS005112.D	12/10/12	LT	n/a	n/a	GSS234

The QC reported here applies to the following samples: Method: RSKSOP-147/175

TC20883-1

CAS No.	Compound	TC21021-2 ug/l (• .		MS %	Limits
74-82-8	Methane	1.49	21.5	24.3	106	68-139



^{* =} Outside of Control Limits.

Method: RSKSOP-147/175

Duplicate Summary Job Number: TC20883

Account: PESTXST EarthCon Consultants

Project: Quarterly Well Sampling, Parker County, Texas

	Sample TC20879-1DUP TC20879-1	File ID SS005062.D SS005061.D		Analyzed 12/07/12 12/07/12	By LT LT	Prep Date n/a n/a	Prep Batch n/a n/a	Analytical Batch GSS233 GSS233
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The QC reported here applies to the following samples:

TC20883-1

CAS No.	Compound	TC20879-1 ug/l Q	DUP ug/l Q	RPD	Limits
74-85-1	Ethene	1.0 U	ND	nc	27
74-84-0	Ethane	1.0 U	ND	nc	43
74-98-6	Propane	1.5 U	ND	nc	21
75-28-5	Isobutane	1.5 U	ND	nc	35
106-97-8	Butane	1.5 U	ND	nc	33



^{* =} Outside of Control Limits.

Method: RSKSOP-147/175

Duplicate Summary Job Number: TC20883

Account: PESTXST EarthCon Consultants

Project: Quarterly Well Sampling, Parker County, Texas

	Sample TC21021-1DUP TC21021-1	File ID SS005111.D SS005110.D		Analyzed 12/10/12 12/10/12	By LT LT	Prep Date n/a n/a	Prep Batch n/a n/a	Analytical Batch GSS234 GSS234
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The QC reported here applies to the following samples:

TC20883-1

		TC21021-1					
CAS No.	Compound	ug/l	Q	ug/l	Q	RPD	Limits
74-82-8	Methane	0.88		0.86		2	53



^{* =} Outside of Control Limits.



ANALYSIS REPORT

Lab #: 321089 Job #: 20030

Sample Name/Number: WW14A-Hur-120212 Company: Oil Tracers, LLC

Date Sampled: 12/02/2012

Container: Dissolved Gas Bottle

Field/Site Name: Third Quarter Well Sampling

Location: Parker County, Texas

Formation/Depth:

Sampling Point:

Date Received: 12/05/2012 Date Reported: 2/01/2013

Component	Chemical mol. %	δ ¹³ C ‰	δD ‰	δ ¹⁸ Ο ‰
Carbon Monoxide	nd .			
Hydrogen Sulfide	na			
Helium	na			
Hydrogen	nd			
Argon	1.52			
Oxygen	0.11			
Nitrogen	84.47			
Carbon Dioxide	0.39			
Methane	13.22	-42.45	-132.0	
Ethane	0.288	-25.0		
Ethylene	nd			
Propane	nd			
Propylene	nd			
Iso-butane	nd			
N-butane	0.0004			
Iso-pentane	0.0009			
N-pentane	nd			
Hexanes +	nd			

Remarks:

Analysis is of gas extracted from water by headspace equilibration. Analysis has been corrected for helium added to create headspace. Helium dilution factor = 0.76

nd = not detected. na = not analyzed. Isotopic composition of hydrogen is relative to VSMOW. Isotopic composition of carbon is relative to VPDB. Isotopic composition of oxygen is relative to VSMOW, except for carbon dioxide which is relative to VPDB. Calculations for BTU and specific gravity per ASTM D3588. Chemical compositions are normalized to 100%. Mol. % is approximately equal to vol. %.

^{*}Addition of helium negates the ability to detect native helium and may negate the ability to detect hydrogen.

^{**} Ethane isotopes obtained online via GC-C-IRMS



12/12/12



Technical Report for

EarthCon Consultants

Quarterly Well Sampling, Parker County, Texas

3rd Quarter / WW15-Hur

Accutest Job Number: TC20887

Sampling Date: 12/02/12

Report to:

EarthCon Consultants 4800 Sugar Grove Suite 420 Stafford, TX 77477

gfloreslovo@earthcon.com; djackson@jacksonsjoberg.com; mcpatton@rangeresources.com; escott@earthcon.com

ATTN: Gabriela Floreslovo

Total number of pages in report: 26



Test results contained within this data package meet the requirements of the National Environmental Laboratory Accreditation Conference and/or state specific certification programs as applicable.

Richard Robriguez Laboratory Director

Client Service contact: Elessa Sommers 713-271-4700

Certifications: TX (T104704220-12-8) AR (11-028-0) AZ (AZ0769) FL (E87628) KS (E-10366) LA (85695/04004) OK (211-035)

This report shall not be reproduced, except in its entirety, without the written approval of Accutest Laboratories. Test results relate only to samples analyzed.

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Sample Summary

EarthCon Consultants

Job No: TC20887

Quarterly Well Sampling, Parker County, Texas Project No: 3rd Quarter / WW15-Hur

Sample	-			Matr		Client	
Number	Date	Time By	Received	Code	Туре	Sample ID	
TC20887-1	12/02/12	11:28	12/04/12	AQ	Ground Water	WW15-HUR-120212	





SAMPLE DELIVERY GROUP CASE NARRATIVE

Client: EarthCon Consultants Job No TC20887

Site: Quarterly Well Sampling, Parker County, Texas Report Date 12/12/2012 8:56:23 AM

1 Sample was collected on 12/02/2012 and received intact at Accutest on 12/04/2012 and properly preserved in 1 cooler at 2.4 Deg C. The sample received an Accutest job number of TC20887. A listing of the Laboratory Sample ID, Client Sample ID and date of collection are presented in the Results Summary Section of this report.

Except as noted below, all method specified calibrations and quality control performance criteria were met for this job. For more information, please refer to QC summary pages.

Volatiles by GCMS By Method SW846 8260B

Matrix AO Batch ID: VZ3820

- All samples were analyzed within the recommended method holding time.
- All method blanks for this batch meet method specific criteria.
- Sample(s) TC20772-2MS, TC20772-2MSD were used as the QC samples indicated.

Volatiles by GC By Method RSKSOP-147/175

Matrix AQ Batch ID: GSS234

- All samples were analyzed within the recommended method holding time.
- All method blanks for this batch meet method specific criteria.
- Sample(s) TC21021-1DUP, TC21021-2MS were used as the QC samples indicated.
- Matrix Spike Recovery for Ethane is outside control limits. Probable cause due to matrix interference.

Accutest Laboratories Gulf Coast (ALGC) certifies that this report meets the project requirements for analytical data produced for the samples as received at ALGC and as stated on the COC. ALGC certifies that the data meets the Data QualityObjectives for precision, accuracy and completeness as specified in the ALGC Quality Manual except as noted above. This report is to be used in its entirety. ALGC is not responsible for any assumptions of data quality if partial data packages are used



Summary of Hits Job Number: TC20887

Account: EarthCon Consultants

Quarterly Well Sampling, Parker County, Texas 12/02/12**Project:**

Collected:

Lab Sample ID Analyte	Client Sample ID	Result/ Qual	MQL	SDL	Units	Method
TC20887-1	WW15-HUR-1202	212				
Methane Ethane		5.32 0.231	0.025 0.0010	0.015 0.00050	mg/l mg/l	RSKSOP-147/175 RSKSOP-147/175



Sample Results	
Report of Analysis	



Report of Analysis

Client Sample ID: WW15-HUR-120212

 Lab Sample ID:
 TC20887-1
 Date Sampled:
 12/02/12

 Matrix:
 AQ - Ground Water
 Date Received:
 12/04/12

 Method:
 SW846 8260B
 Percent Solids:
 n/a

Project: Quarterly Well Sampling, Parker County, Texas

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	Z030548.D	1	12/06/12	EM	n/a	n/a	VZ3820
Run #2							

	Purge Volume	
Run #1	5.0 ml	
Run #2		

Purgeable Aromatics

CAS No.	Compound	Result	MQL	SDL	Units	Q
71-43-2 108-88-3 100-41-4 1330-20-7	Benzene Toluene Ethylbenzene Xylene (total)	0.00034 U 0.00033 U 0.00032 U 0.00087 U	0.0010 0.0010 0.0010 0.0030	0.00034 0.00033 0.00032 0.00087	mg/l mg/l mg/l mg/l	
CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits		
1868-53-7 17060-07-0 2037-26-5 460-00-4	Dibromofluoromethane 1,2-Dichloroethane-D4 Toluene-D8 4-Bromofluorobenzene	94% 83% 90% 94%		72-122% 68-124% 80-119% 72-126%		

 $\begin{array}{ll} U = & Not \; detected & SDL \; - \; Sample \; Detection \; Limit \\ MQL = & Method \; Quantitation \; Limit \\ \end{array}$

E = Indicates value exceeds calibration range

J = Indicates an estimated value

B = Indicates analyte found in associated method blank N = Indicates presumptive evidence of a compound



Report of Analysis

Client Sample ID: WW15-HUR-120212

 Lab Sample ID:
 TC20887-1
 Date Sampled:
 12/02/12

 Matrix:
 AQ - Ground Water
 Date Received:
 12/04/12

 Method:
 RSKSOP-147/175
 Percent Solids:
 n/a

Project: Quarterly Well Sampling, Parker County, Texas

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	SS005107.D	1	12/10/12	LT	n/a	n/a	GSS234
Run #2	SS005109.D	50	12/10/12	LT	n/a	n/a	GSS234

RSK147 Special List

CAS No.	Compound	Result	MQL	SDL	Units	Q
74-82-8	Methane	5.32 a	0.025	0.015	mg/l	
74-85-1	Ethene	0.00050 U	0.0010	0.00050	mg/l	
74-84-0	Ethane	0.231	0.0010	0.00050	mg/l	
74-98-6	Propane	0.00075 U	0.0015	0.00075	mg/l	
75-28-5	Isobutane	0.00075 U	0.0015	0.00075	mg/l	
106-97-8	Butane	0.00075 U	0.0015	0.00075	mg/l	

(a) Result is from Run# 2

U = Not detected

SDL - Sample Detection Limit

MQL = Method Quantitation Limit

E = Indicates value exceeds calibration range

J = Indicates an estimated value

B = Indicates analyte found in associated method blank N = Indicates presumptive evidence of a compound





Misc. Forms

Custody Documents and Other Forms

Includes the following where applicable:

- Chain of Custody
- LRC Form



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r	X Standard	Approved By (Accu	rtest PM): / Date:			Commerc				2.00		T TE					1000								
	5 Day RUSH				1 —	Commerc							DD Fo	ormat											
	4 Day RUSH					FULT1 (	Leve	13+4)			Ī	∍ ⊡	ther_	-											
ı	3 Day RUSH					REDT1 (			)							- 1									
	2 Day RUSH					Commer																			
	1 Day EMERGENCY		<u> </u>							I "A" =															
	Emergency & Rush T/A data available VIA Lablink	197	70		1	*							C Sumi C & Su	mary Irrogate	Summ	arv									
8	~ 174·	72 Sa	mple Custody m	ust be docur	mented b	elow eac											delivery.						r de la		
P	Relinquished by Sampler: Date Time:		Received By-	$\overline{}$			/	_	Reli	inquish	ed By:						Date	Time:	-	Receiv	ed By:				
¥	sph littley 12/0/1	2 1547	4		_	<b>\</b>	_		2											2					
ł	Relinquished by Sampler: Date Time:		Received By:					\	Reli	inquish	ed By:						Date	Time:		Receiv 4	ed By:				
F	Relinquished by: Date Time:		Received By:			_	-		Ž.,	tody S	eal#				ntact		Preserved wh	ere appli	cable	17		On Ice		Caole	r Temp.
1	5		5			_		_		,	.,,,,,,,,				Vot intac										

TC20887: Chain of Custody Page 1 of 4





## **Accutest Laboratories Sample Receipt Summary**

Accutest Job Number: TC20887	Client:	EARTHCON CONSULTANT	s	Project: 3RD QTR WEL	L SAMPLIN	IG,PARKE	R COUNTY,T
Date / Time Received: 12/4/2012		Delivery Method:	Client A	irbill #'s:			
No. Coolers: 1 Therm ID:	IR6		Те	mp Adjustment Factor:	0.2		
Cooler Temps (Initial/Adjusted): #1: (2.2/	2.4)						
Cooler Security Y or N		Y or N	Sample Integrity -	Documentation	<u>Y</u>	or N	
1. Custody Seals Present:	3. COC Pr		Sample labels pre	esent on bottles:	<b>~</b>		
2. Custody Seals Intact: ✓ 4.	Smpl Dates	s/Time OK 🔽 🗌	2. Container labeling	g complete:	<b>✓</b>		
Cooler Temperature Y or N	_		3. Sample container	label / COC agree:		<b>✓</b>	
1. Temp criteria achieved:	]		Sample Integrity	- Condition	<u>Y</u>	or N	
Cooler temp verification:			Sample recvd with		<b>✓</b>		
3. Cooler media:			2. All containers acc	ounted for:	✓		
Quality Control Preservation Y or N	I N/A	WTB STB	3. Condition of samp	ole:		ntact	
1. Trip Blank present / cooler:			Sample Integrity	- Instructions	Υ	or N	N/A
2. Trip Blank listed on COC:			Analysis request	ed is clear:	<u> </u>		<u></u>
3. Samples preserved properly: ✓	]		2. Bottles received	for unspecified tests		<b>✓</b>	
4. VOCs headspace free: ✓			3. Sufficient volume	recvd for analysis:	✓		
			4. Compositing inst	ructions clear:			<b>~</b>
			5. Filtering instruction	ons clear:			<b>V</b>
Comments -Received trip blank not listed on C - Two of six vial labels list "WW12-		12" as sample ID, time/date ma	tch COC.				

TC20887: Chain of Custody Page 2 of 4

Page 1 of 3







### **Problem Resolution**

Accutest Job Number: TC20887

**CSR**: Elessa Sommers Response Date: 12/5/2012

Response: Trip blank is on separate report.

7

TC20887: Chain of Custody Page 3 of 4







### Sample Receipt Log

 Job #:
 TC20887
 Date / Time Received:
 12/4/2012 9:22:00 AM
 Initials:
 CH

Client: EARTHCON CONSULTANTS

Cooler #	Sample ID:	Vol	Bot #	Location	Pres	рН	Therm ID	Initial Temp	Therm CF	Corrected Temp
1	TC20887-1	40ml	1	VR	HCL	Note #1 - Preservative to be checked by analyst at the instrument.	IR6	2.2	0.2	2.4
1	TC20887-1	40ml	2	VR	HCL	Note #1 - Preservative to be checked by analyst at the instrument.	IR6	2.2	0.2	2.4
1	TC20887-1	40ml	3	VR	HCL	Note #1 - Preservative to be checked by analyst at the instrument.	IR6	2.2	0.2	2.4
1	TC20887-1	40ml	4	VR	HCL	Note #1 - Preservative to be checked by analyst at the instrument.	IR6	2.2	0.2	2.4
1	TC20887-1	40ml	5	VR	HCL	Note #1 - Preservative to be checked by analyst at the instrument.	IR6	2.2	0.2	2.4
1	TC20887-1	40ml	6	VR	HCL	Note #1 - Preservative to be checked by analyst at the instrument.	IR6	2.2	0.2	2.4

TC20887: Chain of Custody

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# Appendix A Laboratory Data Package Cover Page

This signature page, the laboratory review checklist, and the following reportable data:

TC20887 This data package consists of

QA Manager Name (Printed)

Richard Rodriguez

Signature

÷	IX I	riela chain-oi-custody documenta	ation,
	R2	Sample identification cross-refere	nce;
	R3	Test reports (analytical data sheet	ts) for each environmental sample that includes:
		a)	Items consistent with NELAC 5.13 or ISO/IEC 17025 Section 5.10
		b)	dilution factors,
		c)	preparation methods,
		d)	cleanup methods, and
		e)	if required for the project, tentatively identified compounds (TICs).
	R4	Surrogate recovery data including	<b>;</b>
		a)	Calculated recovery (%R), and
		b)	The laboratory's surrogate QC limits.
	R5	Test reports/summary forms for bl	lank samples;
	R6	Test reports/summary forms for la	boratory control samples (LCSs) including:
		a)	LCS spiking amounts,
		b)	Calculated %R for each analyte, and
		c)	The laboratory's LCS QC limits.
	R7	Test reports for project matrix spik	ce/matrix spike duplicates (MS/MSDs) including:
		a)	Samples associated with the MS/MSD clearly identified,
		b)	MS/MSD spiking amounts,
		c)	Concentration of each MS/MSD analyte measured in the parent and
		d)	Calculated %Rs and relative percent differences (RPDs), and
		e)	The laboratory's MS/MSD QC limits
	R8	Laboratory analytical duplicate (if	applicable) recovery and precision:
		a)	The amount of analyte measured in the duplicate,
		b)	The calculated RPD, and
		c)	The laboratory's QC limits for analytical duplicates.
Ģ	R9	List of method quantitation limits (	MQLs) and detectability check sample results for each analyte for each
	R10	Other problems or anomalies.	
The Exce	ption Report	t for each "No" or "Not Reviewed (N	R)" item in Laboratory Review Checklist and for each analyte, matrix, and
method fo	or which the	laboratory does not hold NELAC ac	creditation under the Texas Laboratory Accreditation Program.
Release	Statement:	I am responsible for the release of	this laboratory data package. This laboratory is NELAC accredited under the
			ods, analytes, and matrices reported in this data package except as noted in
the Excep	tion Report.	This data package has been review	wed by the laboratory and is complete and technically compliant with the
requireme	ents of the m	nethods used, except where noted b	by the laboratory in the attached exception reports. By my signature below, I
affirm to the	ne best of m	y knowledge, all problems/anomalie	es, observed by the laboratory as having the potential to affect the quality of
the data, I	nave been id	dentified by the laboratory in the Lal	boratory Review Checklist, and no information or data have been knowingly
withheld.		•	
	applicable	: This laboratory meets an exception	n under 30 TAC&25.6 and was last inspection by
[]		[X ] TCEQ or [ ] on Apr	il 2011. Any findings affecting the data in this laboratory data package are
		noted in the Exception Reports he	erein. The official signing the cover page of the report in which these data are
		used is responsible for releasing t	this data package and is by signature affirming the above release statement

Official Title (printed)

Laboratory Director

Date 12/12/2012



	L	ABORATORY REVIEW CHECKLIST: REPORTABLE	DAT	Ά		
Laboratory	/ Name:	Accutest Gulf Coast LRC Date:	12/	12/2	012	
		Quarterly Well Sampling, Parker				
Project Na	me:	County, Texas Laboratory Project Number:	TC	2088	7	
Reviewer	Name:	Anita Patel Prep Batch Number(s):	GSS	234,	VZ38	20
# ¹	A ²	DESCRIPTION	YES	NO	NA ³	NR⁴ ER #5
R1	OI	CHAIN-OF-CUSTODY (C-O-C):				
		Did samples meet the laboratory's standard conditions of sample acceptability	l x			
		upon receipt?				
		Were all departures from standard conditions described in an exception report?	X			
R2	OI	Sample and quality control (QC) identification				
		Are all field sample ID numbers cross-referenced to the laboratory ID numbers?	X			
		Are all laboratory ID numbers cross-referenced to the corresponding QC data?	X			
R3	OI	Test reports				
		Were samples prepared and analyzed within holding times?	X			
		Other than those results <mql, all="" bracketed="" by="" calibration<="" other="" raw="" td="" values="" were=""><td>X</td><td></td><td></td><td></td></mql,>	X			
		standards?	<del>  , , </del>			
		Were calculations checked by a peer or supervisor?	X			
		Were all analyte identifications checked by a peer or supervisor?  Were sample detection limits reported for all analytes not detected?	X			
		Were all results for soil and sediment samples reported on a dry weight basis?	+^		Х	
		Were % moisture (or solids) reported for all soil and sediment samples?	+-		X	
		Were bulk soils/solids samples for volatile analysis extracted with methanol per	+-			
		SW846 Method 5035?			Х	
		If required for the project, are TIC's reported?	1		Х	
R4	0	Surrogate recovery data				
		Were surrogates added prior to extraction?	Х			
		Were surrogate percent recoveries in all samples within the laboratory QC limits?	X			
R5	OI	Test reports/summary forms for blank samples				
		Were appropriate type(s) of blanks analyzed?	X			
		Were blanks analyzed at the appropriate frequency?  Were method blanks taken through the entire analytical process, including	X			
		preparation and, if applicable, cleanup procedures?	Х			
		Were blank concentrations <mql?< td=""><td>X</td><td></td><td></td><td></td></mql?<>	X			
R6	OI	Laboratory control samples (LCS):				
		Were all COCs included in the LCS?	Х			
		Was each LCS taken through the entire analytical procedure, including prep and	X			
		cleanup steps?				
		Were LCSs analyzed at required frequency?	Х			
		Were LCS (and LCSD, if applicable) %Rs within the laboratory QC limits?	Х			
		Does the detectability check sample data document the laboratory's capability to	l x			5
		detect the COCs at the MDL used to calculate the SDLs?	+			
R7	OI	Was the LCSD RPD within QC limits?			Χ	
K/	- U	Matrix spike (MS) and matrix spike duplicate (MSD) data  Were the project/method specified analytes included in the MS and MSD?	X			
		Were MS/MSD analyzed at the appropriate frequency?	X			
		Were MS (and MSD, if applicable) %Rs within the laboratory QC Limits?	<del>  ^`</del>	Х		4
		Were the MS/MSD RPDs within laboratory QC limits?	Х	Ė		
R8	OI	Analytical duplicate data				
		Were appropriate analytical duplicates analyzed for each matrix?	Х			
		Were analytical duplicates analyzed at the appropriate frequency?	Х			
		Were RPDs or relative standard deviations within the laboratory QC limits?	Х			
R9	OI	Method quantitation limits (MQLs):	1			
		Are the MQLs for each method analyte included in the laboratory data package?	X	$\vdash$		
		Do the MQLs correspond to the concentration of the lowest non-zero calibration	X	-		-
R10	OI	Are unadjusted MQLs and DCSs included in the laboratory data package?  Other problems/anomalies		Х		2
10	0	Are all known problems/anomalies/special conditions noted in this LRC and ER?	X			
		Was applicable and available technology used to lower the SDL to minimize the	^			
		Is the laboratory NELAC-accredited under the Texas Laboratory Accreditation	Ť			
		Program for the analytes, matrices, and methods associated with this laboratory	X			3
		data package?				
	•					



Laboratory Name:		Accutest Gulf Coast	LRC Date:	12/12/2012				
Project Na	me:	Quarterly Well Sampling, Parker	Laboratory Project Number:	TC	TC20887			
Reviewer	Name:	Anita Patel	Prep Batch Number(s):	GSS2	234,	VZ38	20	
#1	A ²	DESCRIPTION		YES	NO	NA ³	NR⁴	ER#5
S1	OI	Initial calibration (ICAL)						
		Were response factors and/or relative	х					
		limits?		^				
		Were percent RSDs or correlation co	efficient criteria met?	Х				
		Was the number of standards recom	mended in the method used for all analytes?	Х				
		Were all points generated between the	ne lowest and highest standard used to	х				
		calculate the curve?		^ X				
		Are ICAL data available for all instruments used?						
	Has the initial calibration curve been verified using an appropriate second source							
		standard?						
S2	OI		ial and continuing calibration verification (ICCV AND CCV) and continuing					
		Was the CCV analyzed at the metho		Х				
			alyte within the method-required QC limits?	X				
			Vas the ICAL curve verified for each analyte?					
		Was the absolute value of the analyte			Х			
S3	0	Mass spectral tuning						
		Was the appropriate compound for the		Х				
		Were ion abundance data within the	method-required QC limits?	Х				
S4	0		Internal standards (IS)					
		Were IS area counts and retention tir	Х					
S5	OI	Raw data (NELAC Section 5.5.10)						
		Were the raw data (for example, chromatograms, spectral data) reviewed by an						
		analyst? Were data associated with manual integrations flagged on the raw data?						
			Х	_				
S6	0	Dual column confirmation			L 1/			
		Did dual column confirmation results			Х			
S7	0		Tentatively identified compounds (TICs):  If TICs were requested, were the mass spectra and TIC data subject to appropriate					
		checks?	ss spectra and TIC data subject to appropriate			Х		
S8	<u> </u>	Interference Check Sample (ICS) r	eculte		-			
36	'	Were percent recoveries within meth				Х		
S9	<u> </u>		kes, and method of standard additions					
39	<u> </u>		, and the linearity within the QC limits					
		specified in the method?	, and the inicality within the QO ininto			Х		
S10	OI	Method detection limit (MDL) stud	ios					
<del>- 0.0</del>	- 01	Was a MDL study performed for each		Х				
		Is the MDL either adjusted or suppor		X				5
S11	OI	Proficiency test reports	tou by the unaryone of Deec.	^				
	<u> </u>		ceptable on the applicable proficiency tests or					
		evaluation studies?		Х				
S12	OI	Standards documentation						
		Are all standards used in the analyse	es NIST-traceable or obtained from other					
		appropriate source?		Х				
S13	OI	Compound/analyte identification p	rocedures					
		Are the procedures for compound/an		Х				
S14	OI	Demonstration of analyst compete	•					
		Was DOC conducted consistent with		Х				
		Is documentation of the analyst's con	<u> </u>	Х				
S15	OI	Verification/validation documentation	tion for methods (NELAC Chapter 5)					
			the data documentated, verified, and	\ \ \ \ \				
		validated, where applicable?		X		1		
S16	OI	Laboratory standard operating pro	ocedures (SOPs)					
		Are laboratory SOPs current and on		Х				



Laboratory	Name:	Accutest Gulf Coast	LRC Date:	12/12/2012						
Project Na	me:	Quarterly Well Sampling, Parker	Laboratory Project Number:	TC20887						
Reviewer	Name:	Anita Patel	Prep Batch Number(s):	GSS234, VZ3820						
ER# ¹	Descripti	on		•						
1	blank. The	ing purposes, the MQL is defined in the e SDL is defined in the report as the MI	DL. ,	·						
2	For reporting purposes, the method blank represents the unadjusted MQL. The DCS is on file in the laboratory and is not included in the laboratory data package.									
3	methods a	atory is NELAC-accredited under the T associated with this laboratory data pac	kage for analytes that are listed in the							
4	All anoma	lies are discussed in the case narrative	9.							
5		atory does not perform DCS analysis for ve values in the Texas TRRP PCL table		components reported are not listed of						
	1									

1ER# = Exception Report identification number (an Exception Report should be completed for an item if "NR" or "No" is checked on





## GC/MS Volatiles

QC Data Summaries

Includes the following where applicable:

- Method Blank Summaries
- Blank Spike Summaries
- Matrix Spike and Duplicate Summaries



**Method:** SW846 8260B

# Method Blank Summary Job Number: TC20887

PESTXST EarthCon Consultants **Account:** 

**Project:** Quarterly Well Sampling, Parker County, Texas

Sample VZ3820-MB	<b>File ID</b> Z030534.D	<b>DF</b> 1	<b>Analyzed</b> 12/06/12	<b>By</b> EM	<b>Prep Date</b> n/a	<b>Prep Batch</b> n/a	Analytical Batch VZ3820

The QC reported here applies to the following samples:

CAS No.	Compound	Result	RL	MDL	Units Q
71-43-2	Benzene	ND	1.0	0.34	ug/l
100-41-4	Ethylbenzene	ND	1.0	0.32	ug/l
108-88-3	Toluene	ND	1.0	0.33	ug/l
1330-20-7	Xylene (total)	ND	3.0	0.87	ug/l

CAS No.	<b>Surrogate Recoveries</b>		Limits
17060-07-0	Dibromofluoromethane 1,2-Dichloroethane-D4 Toluene-D8	95% 86% 88%	72-122% 68-124% 80-119%
460-00-4	4-Bromofluorobenzene	93%	72-126%



**Method:** SW846 8260B

# Blank Spike Summary Job Number: TC20887

Account: PESTXST EarthCon Consultants

Quarterly Well Sampling, Parker County, Texas **Project:** 

Sample VZ3820-BS	<b>File ID</b> Z030532.D	<b>DF</b> 1	<b>Analyzed</b> 12/06/12	By EM	<b>Prep Date</b> n/a	<b>Prep Batch</b> n/a	Analytical Batch VZ3820

The QC reported here applies to the following samples:

CAS No.	Compound	Spike ug/l	BSP ug/l	BSP %	Limits
71-43-2	Benzene	25	20.7	83	68-119
100-41-4	Ethylbenzene	25	20.6	82	71-117
108-88-3	Toluene	25	20.8	83	73-119
1330-20-7	Xylene (total)	75	64.2	86	74-119

CAS No.	<b>Surrogate Recoveries</b>	BSP	Limits
17060-07-0	Dibromofluoromethane	92%	72-122%
	1,2-Dichloroethane-D4	84%	68-124%
	Toluene-D8	91%	80-119%
	4-Bromofluorobenzene	91%	72-126%



^{* =} Outside of Control Limits.

**Method:** SW846 8260B

# Matrix Spike/Matrix Spike Duplicate Summary

Job Number: TC20887

Account: PESTXST EarthCon Consultants

**Project:** Quarterly Well Sampling, Parker County, Texas

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	<b>Analytical Batch</b>
TC20772-2MS	Z030536.D	1	12/06/12	EM	n/a	n/a	VZ3820
TC20772-2MSD	Z030537.D	1	12/06/12	EM	n/a	n/a	VZ3820
TC20772-2	Z030535.D	1	12/06/12	EM	n/a	n/a	VZ3820

The QC reported here applies to the following samples:

CAS No.	Compound	TC20772-2 ug/l Q	Spike ug/l	MS ug/l	MS %	MSD ug/l	MSD %	RPD	Limits Rec/RPD
71-43-2	Benzene	ND	25	21.6	86	20.6	82	5	68-119/12
100-41-4	Ethylbenzene	ND	25	21.4	86	20.9	84	2	71-117/12
108-88-3	Toluene	ND	25	20.5	82	20.5	82	0	73-119/13
1330-20-7	Xylene (total)	ND	75	68.6	91	64.8	86	6	74-119/13

CAS No.	<b>Surrogate Recoveries</b>	MS	MSD	TC20772-2	Limits
1868-53-7	Dibromofluoromethane	94%	93%	99%	72-122%
17060-07-0	1,2-Dichloroethane-D4	83%	84%	87%	68-124%
2037-26-5	Toluene-D8	86%	89%	89%	80-119%
460-00-4	4-Bromofluorobenzene	89%	91%	94%	72-126%



^{* =} Outside of Control Limits.



## GC Volatiles

# QC Data Summaries

## Includes the following where applicable:

- Method Blank Summaries
- Blank Spike Summaries
- Matrix Spike and Duplicate Summaries



Method: RSKSOP-147/175

# Method Blank Summary Job Number: TC20887

Account: PESTXST EarthCon Consultants

Quarterly Well Sampling, Parker County, Texas **Project:** 

Sample GSS234-MB	File ID SS005099.D	<b>DF</b> 1	<b>Analyzed</b> 12/10/12	By LT	<b>Prep Date</b> n/a	<b>Prep Batch</b> n/a	Analytical Batch GSS234

The QC reported here applies to the following samples:

CAS No.	Compound	Result	RL	MDL	Units Q
74-82-8	Methane	ND	0.50	0.30	ug/l
74-85-1	Ethene	ND	1.0	0.50	ug/l
74-84-0	Ethane	ND	1.0	0.50	ug/l
74-98-6	Propane	ND	1.5	0.75	ug/l
75-28-5	Isobutane	ND	1.5	0.75	ug/l
106-97-8	Butane	ND	1.5	0.75	ug/l



Method: RSKSOP-147/175

# Blank Spike Summary Job Number: TC20887

PESTXST EarthCon Consultants Account:

Quarterly Well Sampling, Parker County, Texas **Project:** 

Sample	<b>File ID</b>	<b>DF</b>	<b>Analyzed</b> 12/10/12	By	Prep Date	Prep Batch	Analytical Batch
GSS234-BS	SS005096. D	1		LT	n/a	n/a	GSS234

The QC reported here applies to the following samples:

CAS No.	Compound	Spike ug/l	BSP ug/l	BSP %	Limits
74-82-8	Methane	21.5	20.9	97	68-139
74-85-1	Ethene	57.4	43.4	76	52-145
74-84-0	Ethane	43.3	49.3	114	68-131
74-98-6	Propane	60.6	59.3	98	69-131
75-28-5	Isobutane	72.5	69.9	96	72-131
106-97-8	Butane	76.6	73.6	96	66-128



^{* =} Outside of Control Limits.

Method: RSKSOP-147/175

# Matrix Spike Summary Job Number: TC20887

Account: PESTXST EarthCon Consultants

**Project:** Quarterly Well Sampling, Parker County, Texas

Sample TC21021-2MS TC21021-2	File ID SS005113.D SS005112.D	<b>Analyzed</b> 12/10/12 12/10/12	By LT LT	Prep Date n/a n/a	Prep Batch n/a n/a	Analytical Batch GSS234 GSS234

The QC reported here applies to the following samples:

CAS No.	Compound	TC21021-2 ug/l Q	Spike ug/l	MS ug/l	MS %	Limits
74-82-8	Methane	1.49	21.5	24.3	106	68-139
74-85-1	Ethene	ND	57.4	55.4	97	52-145
74-84-0	Ethane	ND	43.3	64.1	148*	68-131
74-98-6	Propane	ND	60.6	75.7	125	69-131
75-28-5	Isobutane	ND	72.5	87.2	120	72-131
106-97-8	Butane	ND	76.6	93.9	123	66-128



^{* =} Outside of Control Limits.

Method: RSKSOP-147/175

# **Duplicate Summary Job Number:** TC20887

PESTXST EarthCon Consultants Account:

**Project:** Quarterly Well Sampling, Parker County, Texas

Sample TC21021-1DUP	File ID SS005111.D		Analyzed 12/10/12	By LT	Prep Date	Prep Batch	Analytical Batch GSS234
TC21021-1	SS005110.D	1	12/10/12	LT	n/a	n/a	GSS234

The QC reported here applies to the following samples:

CAS No.	Compound	TC21021-1 ug/l Q	DUP ug/l Q	RPD	Limits
74-82-8	Methane	0.88	0.86	2	53
74-85-1	Ethene	ND	ND	nc	27
74-84-0	Ethane	ND	ND	nc	43
74-98-6	Propane	ND	ND	nc	21
75-28-5	Isobutane	ND	ND	nc	35
106-97-8	Butane	ND	ND	nc	33



^{* =} Outside of Control Limits.



## ANALYSIS REPORT

Lab #: 321087 Job #: 20030

Sample Name/Number: WW15-Hur-120212
Company: Oil Tracers, LLC

Date Sampled: 12/02/2012

Container: Dissolved Gas Bottle

Field/Site Name: Third Quarter Well Sampling

Location: Parker County, Texas

Formation/Depth:

Sampling Point:

Date Received: 12/05/2012 Date Reported: 2/01/2013

Component	Chemical mol. %	δ ¹³ C ‰	δD ‰	δ ¹⁸ Ο ‰
Carbon Monoxide	nd			
Hydrogen Sulfide	na			
Helium	na			
Hydrogen	nd			
Argon	1.31			
Oxygen	0.096			
Nitrogen	72.45			
Carbon Dioxide	0.19			
Methane	25.04	-46.43	-157.5	
Ethane	0.910	-30.2		
Ethylene	nd			
Propane	nd			
Propylene	nd			
Iso-butane	nd			
N-butane	0.0011			
Iso-pentane	nd			
N-pentane	nd			
Hexanes +	0.0007			

#### Remarks:

Analysis is of gas extracted from water by headspace equilibration. Analysis has been corrected for helium added to create headspace. Helium dilution factor = 0.73

nd = not detected. na = not analyzed. Isotopic composition of hydrogen is relative to VSMOW. Isotopic composition of carbon is relative to VPDB. Isotopic composition of oxygen is relative to VSMOW, except for carbon dioxide which is relative to VPDB. Calculations for BTU and specific gravity per ASTM D3588. Chemical compositions are normalized to 100%. Mol. % is approximately equal to vol. %.

^{*}Addition of helium negates the ability to detect native helium and may negate the ability to detect hydrogen.

^{**} Ethane isotopes obtained online via GC-C-IRMS





EarthCon Consultants

Quarterly Well Sampling, Parker County, Texas

3rd Quarter / WW25-Mat

Accutest Job Number: TC20881

Sampling Date: 12/02/12



EarthCon Consultants 4800 Sugar Grove Suite 420

Stafford, TX 77477

gfloreslovo@earthcon.com; djackson@jacksonsjoberg.com; mcpatton@rangeresources.com; escott@earthcon.com

ATTN: Gabriela Floreslovo

Total number of pages in report: 27



Test results contained within this data package meet the requirements of the National Environmental Laboratory Accreditation Conference and/or state specific certification programs as applicable.

Client Service contact: Elessa Sommers 713-271-4700

Certifications: TX (T104704220-12-8) AR (11-028-0) AZ (AZ0769) FL (E87628) KS (E-10366) LA (85695/04004) OK (211-035)

This report shall not be reproduced, except in its entirety, without the written approval of Accutest Laboratories. Test results relate only to samples analyzed.

Laboratory Director





10165 Harwin Drive Houston, TX 77036 Tel: 713-271-4700

www.accutest.com

Friday, December 28, 2012

EarthCon Consultants 4800 Sugar Grove, Suite 420 Stafford, TX 77477 ATTN: Gabriela Floreslovo

RE: Accutest job TC20881 Reissue

Dear Ms. Floreslovo:

The final report for job number TC20881 has been revised to add a "J" flag to the Ethane result.

I apologize for any inconvenience. Please feel free to contact me if I can be of further assistance.

Sincerely,

Elessa Sommers

Elessa Sommers Project Manager



## **Sections:**

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# **Sample Summary**

EarthCon Consultants

Job No:

TC20881

Quarterly Well Sampling, Parker County, Texas Project No: 3rd Quarter / WW25-Mat

Sample	Collected		D . 1	Matr		Client
Number	Date	Time By	Received	Code	Туре	Sample ID
TC20881-1	12/02/12	09:27	12/04/12	AQ	Ground Water	WW25-MAT-120212





### SAMPLE DELIVERY GROUP CASE NARRATIVE

Client: EarthCon Consultants Job No TC20881

Site: Quarterly Well Sampling, Parker County, Texas Report Date 12/12/2012 9:39:20 AM

1 Sample was collected on 12/02/2012 and received intact at Accutest on 12/04/2012 and properly preserved in 1 cooler at 2.4 Deg C. The sample received an Accutest job number of TC20881. A listing of the Laboratory Sample ID, Client Sample ID and date of collection are presented in the Results Summary Section of this report.

Except as noted below, all method specified calibrations and quality control performance criteria were met for this job. For more information, please refer to QC summary pages.

### Volatiles by GCMS By Method SW846 8260B

Matrix AO Batch ID: VK578

- All samples were analyzed within the recommended method holding time.
- All method blanks for this batch meet method specific criteria.
- Sample(s) TC20506-1MS, TC20506-1MSD were used as the QC samples indicated.

### Volatiles by GC By Method RSKSOP-147/175

Matrix AQ Batch ID: GSS233

- All samples were analyzed within the recommended method holding time.
- All method blanks for this batch meet method specific criteria.
- Sample(s) TC20879-1DUP, TC20970-2MS were used as the QC samples indicated.
- Matrix Spike Recovery for Methane is outside control limits. Outside control limits due to high level in sample relative to spike
- TC20970-2MS: Sample was not preserved to a pH < 2.

Accutest Laboratories Gulf Coast (ALGC) certifies that this report meets the project requirements for analytical data produced for the samples as received at ALGC and as stated on the COC. ALGC certifies that the data meets the Data QualityObjectives for precision, accuracy and completeness as specified in the ALGC Quality Manual except as noted above. This report is to be used in its entirety. ALGC is not responsible for any assumptions of data quality if partial data packages are used



**Summary of Hits Job Number:** TC20881

Account: EarthCon Consultants

Quarterly Well Sampling, Parker County, Texas 12/02/12**Project:** 

Collected:

Lab Sample ID Analyte	Client Sample ID	Result/ Qual	MQL	SDL	Units	Method
TC20881-1	WW25-MAT-1202	212				
Methane Ethane		0.00676 0.00081 J	0.00050 0.0010	0.00030 0.00050	mg/l mg/l	RSKSOP-147/175 RSKSOP-147/175



Sample Results	
Report of Analysis	



# **Report of Analysis**

Client Sample ID: WW25-MAT-120212

 Lab Sample ID:
 TC20881-1
 Date Sampled:
 12/02/12

 Matrix:
 AQ - Ground Water
 Date Received:
 12/04/12

 Method:
 SW846 8260B
 Percent Solids:
 n/a

**Project:** Quarterly Well Sampling, Parker County, Texas

	File ID	DF	Analyzed	By	<b>Prep Date</b>	Prep Batch	Analytical Batch
Run #1	K13195.D	1	12/06/12	EM	n/a	n/a	VK578
Run #2							

	Purge Volume	
Run #1	5.0 ml	
Run #2		

### **Purgeable Aromatics**

CAS No.	Compound	Result	MQL	SDL	Units	Q
71-43-2 108-88-3 100-41-4 1330-20-7	Benzene Toluene Ethylbenzene Xylene (total)	0.00034 U 0.00033 U 0.00032 U 0.00087 U	0.0010 0.0010 0.0010 0.0030	0.00034 0.00033 0.00032 0.00087	mg/l mg/l mg/l mg/l	
CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits		
1868-53-7 17060-07-0 2037-26-5 460-00-4	Dibromofluoromethane 1,2-Dichloroethane-D4 Toluene-D8 4-Bromofluorobenzene	109% 107% 105% 103%		72-122% 68-124% 80-119% 72-126%		

 $\begin{array}{ll} U = & Not \; detected & SDL \; - \; Sample \; Detection \; Limit \\ MQL = & Method \; Quantitation \; Limit \\ \end{array}$ 

E = Indicates value exceeds calibration range

J = Indicates an estimated value

B = Indicates analyte found in associated method blank N = Indicates presumptive evidence of a compound



# **Report of Analysis**

Client Sample ID: WW25-MAT-120212

 Lab Sample ID:
 TC20881-1
 Date Sampled:
 12/02/12

 Matrix:
 AQ - Ground Water
 Date Received:
 12/04/12

 Method:
 RSKSOP-147/175
 Percent Solids:
 n/a

**Project:** Quarterly Well Sampling, Parker County, Texas

	File ID	DF	Analyzed	By	<b>Prep Date</b>	<b>Prep Batch</b>	<b>Analytical Batch</b>	
Run #1	SS005072.D	1	12/07/12	LT	n/a	n/a	GSS233	
Run #2								

### **RSK147 Special List**

CAS No.	Compound	Result	MQL	SDL	Units	Q
74-82-8	Methane	0.00676	0.00050	0.00030	mg/l	
74-85-1	Ethene	0.00050 U	0.0010	0.00050	mg/l	
74-84-0	Ethane	0.00081	0.0010	0.00050	mg/l	J
74-98-6	Propane	0.00075 U	0.0015	0.00075	mg/l	
75-28-5	Isobutane	0.00075 U	0.0015	0.00075	mg/l	
106-97-8	Butane	0.00075 U	0.0015	0.00075	mg/l	

 $\begin{array}{ll} U = & Not \; detected & SDL \; - \; Sample \; Detection \; Limit \\ MQL = & Method \; Quantitation \; Limit \\ \end{array}$ 

E = Indicates value exceeds calibration range

J = Indicates an estimated value

B = Indicates analyte found in associated method blank N = Indicates presumptive evidence of a compound





Misc. Forms

Custody Documents and Other Forms

Includes the following where applicable:

- Chain of Custody
- LRC Form



PAGE → OF ✓

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TC20881: Chain of Custody
Page 1 of 4





### **Accutest Laboratories Sample Receipt Summary**

Accutest Job Number: To	C20	881		Client:	EARTHCC	N CO	NSI	ULTAI	NTS	Project:	3RD QTR WEI	L SAMPI	ING,	PARKE	R COUNTY,
Date / Time Received: 12	2/4/2	2012			Delivery N	/letho	d:		Client	Airbill #'s:					
No. Coolers: 1		Ther	m ID:	R6						Temp Adjust	ment Factor:	0.2			
Cooler Temps (Initial/Adju	ıste	d): <u>#</u>	1: (2.2/2	<u>'.4)</u>											
Cooler Security	Υ	or N	<u>L</u>			Υ	or	N	Sample Integr	rity - Documer	<u>itation</u>	<u> Y</u>	or	N	
	✓		٠.	3. COC P		<b>✓</b>			1. Sample labe	ls present on bo	tles:	<b>✓</b>			
2. Custody Seals Intact:	✓		] 4. 8	Smpl Date	es/Time OK	$\checkmark$			2. Container lab	beling complete:		<b>✓</b>			
Cooler Temperature		Υ	or N						3. Sample cont	ainer label / CO	agree:	✓			
1. Temp criteria achieved:		<b>~</b>							Sample Integ	rity - Conditio	n	<u>Y</u>	or	N	
2. Cooler temp verification:			ared Gu	n					Sample recv	d within HT:	_	<b>✓</b>			
3. Cooler media:		le	ce (bag)						2. All containers	s accounted for:		<b>✓</b>			
Quality Control Preservat	ion	Υ	or N	N/A	<u>.</u>	WTB	5	STB	3. Condition of	sample:			Inta		
1. Trip Blank present / cooler	:	<b>✓</b>				✓			Sample Integ	ırity - Instructi	ons	Υ	or	N	N/A
2. Trip Blank listed on COC:			<b>✓</b>						1. Analysis reg	quested is clear:	<u></u>	<u> </u>		П	
3. Samples preserved proper	rly:	<b>V</b>							2. Bottles rece	ived for unspeci	ied tests			<u></u>	
4. VOCs headspace free:		<b>V</b>	П	П					3. Sufficient vo	olume recvd for a	nalysis:	<b>✓</b>			
		_	_						4. Compositing	g instructions cle	ar:				<b>✓</b>
									5. Filtering inst	tructions clear:					✓
Comments -Received trip bl	lank	not list	ed on CO	DC.											

TC20881: Chain of Custody

Page 1 of 3

Page 2 of 4







### **Problem Resolution**

12/5/2012

Accutest Job Number: TC20881

CSR: Elessa Sommers Response Date:

Response: Trip blank is on separate report.

5.1

TC20881: Chain of Custody

Page 3 of 4







### Sample Receipt Log

 Job #:
 TC20881
 Date / Time Received:
 12/4/2012 9:22:00 AM
 Initials:
 CH

Client: EARTHCON CONSULTANTS

Cooler #	Sample ID:	Vol	Bot #	Location	Pres	рН	Therm ID	Initial Temp	Therm CF	Corrected Temp
1	TC20881-1	40ml	1	VR	HCL	Note #1 - Preservative to be checked by analyst at the instrument.	IR6	2.2	0.2	2.4
1	TC20881-1	40ml	2	VR	HCL	Note #1 - Preservative to be checked by analyst at the instrument.	IR6	2.2	0.2	2.4
1	TC20881-1	40ml	3	VR	HCL	Note #1 - Preservative to be checked by analyst at the instrument.	IR6	2.2	0.2	2.4
1	TC20881-1	40ml	4	VR	HCL	Note #1 - Preservative to be checked by analyst at the instrument.	IR6	2.2	0.2	2.4
1	TC20881-1	40ml	5	VR	HCL	Note #1 - Preservative to be checked by analyst at the instrument.	IR6	2.2	0.2	2.4
1	TC20881-1	40ml	6	VR	HCL	Note #1 - Preservative to be checked by analyst	IR6	2.2	0.2	2.4

TC20881: Chain of Custody

Page 4 of 4



#### Appendix A **Laboratory Data Package Cover Page**

This signature page, the laboratory review checklist, and the following reportable data:

TC20881 This data package consists of

₽	R1	Field chain-of-custody documentation		
	R2	Sample identification cross-reference	<b>)</b> ;	
₽	R3	Test reports (analytical data sheets) f	or each environmental sample that includes:	
		a)	Items consistent with NELAC 5.13 or ISO/IEC	2 17025 Section 5.10
		b)	dilution factors,	
		c)	preparation methods,	
		d)	cleanup methods, and	
		e)	if required for the project, tentatively identified	d compounds (TICs).
	R4	Surrogate recovery data including:		
		a)	Calculated recovery (%R), and	
		b)	The laboratory's surrogate QC limits.	
	R5	Test reports/summary forms for blank	samples;	
D	R6	Test reports/summary forms for labor	ratory control samples (LCSs) including:	
-		a) ´	LCS spiking amounts,	
		b)	Calculated %R for each analyte, and	
		c)	The laboratory's LCS QC limits.	
ū.	R7	•	natrix spike duplicates (MS/MSDs) including:	
•		a)	Samples associated with the MS/MSD clearly	/ identified
		b)	MS/MSD spiking amounts,	,,
		c)	Concentration of each MS/MSD analyte measures	sured in the parent and
		d)	Calculated %Rs and relative percent differen	•
		e)	The laboratory's MS/MSD QC limits	000 (RT 20), und
ū	R8	Laboratory analytical duplicate (if app	•	
	110	a)	The amount of analyte measured in the dupli	cate
		b)	The calculated RPD, and	cate,
		c)	The laboratory's QC limits for analytical dupli	catos
₽	R9	,	(Ls) and detectability check sample results for	
Ļ D	R10	Other problems or anomalies.	(LS) and detectability check sample results for	each analyte for each
·	ICIO	Other problems of anomalies.		
The Evcen	tion Report	for each "No" or "Not Reviewed (NR)"	item in Laboratory Review Checklist and for e	ach analyte matrix and
		, ,	ditation under the Texas Laboratory Accredita	
memou ioi	WillCit title i	aboratory does not note NELAC accre	unation under the rexas Laboratory Accredita	uon Fiogram.
		•	s laboratory data package. This laboratory is N	
			analytes, and matrices reported in this data p	
			I by the laboratory and is complete and technic	
			ne laboratory in the attached exception reports	
			observed by the laboratory as having the poter	
	ave been id	entified by the laboratory in the Labora	atory Review Checklist, and no information or	data have been knowingly
withheld.				
Check, if a	applicable:	This laboratory meets an exception u	nder 30 TAC&25.6 and was last inspection by	•
[]		[X ] TCEQ or [ ] on April 20	011. Any findings affecting the data in this labo	oratory data package are
			n. The official signing the cover page of the rep	
			data package and is by signature affirming the	
		is true.	add package and is by signature annihing the	above release statement
OA Manac	nor.	is true.		
QA Manag	_	Signaturo	Official Title (printed)	Data
Name (Prir	neu)	Signature	Official Title (printed)	Date
Dichard Da	odriauo <del>z</del>	$\leq 100$	Laboratory Director	12/12/2012
Richard Ro	Junguez	dame	Laboratory Director	12/12/2012



			HECKLIST: REPORTABLE								
Laboratory	/ Name:	Accutest Gulf Coast	LRC Date:	12/	12/2	012					
		Quarterly Well Sampling, Parker		l							
Project Na		County, Texas	Laboratory Project Number:	TC20881 GSS233, VK578							
Reviewer		Anita Patel	Prep Batch Number(s):								
# ¹	A ²	DESCRIPTION		YES	NO	NA	NR*	ER#			
R1	OI	CHAIN-OF-CUSTODY (C-O-C):									
			andard conditions of sample acceptability	X				İ			
		upon receipt?	. 126	- V				<u> </u>			
		· · · · · · · · · · · · · · · · · · ·	anditions described in an exception report?	X	_						
R2	OI	Sample and quality control (QC) id			_						
		<u> </u>	-referenced to the laboratory ID numbers?	Х							
		Are all laboratory ID numbers cross-re	eferenced to the corresponding QC data?	X							
R3	OI	Test reports									
		Were samples prepared and analyze		X							
			all other raw values bracketed by calibration	l x				İ			
		standards?									
		Were calculations checked by a peer		X				<u> </u>			
		Were all analyte identifications check		X				<u> </u>			
		Were sample detection limits reported		X				<u> </u>			
			samples reported on a dry weight basis?	1	<u> </u>	X	<u> </u>	<u> </u>			
		Were % moisture (or solids) reported		1	_	Χ	<u> </u>	<u> </u>			
			latile analysis extracted with methanol per			Х		ĺ			
		SW846 Method 5035?  If required for the project, are TIC's re	norted?	-		Х					
	_	1 1 1	ported?			_ ^					
R4	0	Surrogate recovery data	-410	V							
		Were surrogates added prior to extract		X				<b>-</b>			
DE	01	0 .	all samples within the laboratory QC limits?	<u> </u>							
R5	OI	Test reports/summary forms for blue Were appropriate type(s) of blanks are									
		Were blanks analyzed at the appropri		X			-	<del></del>			
			ne entire analytical process, including	<del>  ^</del>				<b>-</b>			
		preparation and, if applicable, cleanu		X				İ			
		Were blank concentrations <mql?< td=""><td>p procedures :</td><td>X</td><td></td><td></td><td></td><td><u> </u></td></mql?<>	p procedures :	X				<u> </u>			
R6	OI	Laboratory control samples (LCS):		+^							
NO	UI.	Were all COCs included in the LCS?		Х							
			ire analytical procedure, including prep and								
		cleanup steps?	are arranytical procedure, including prep and	X				İ			
		Were LCSs analyzed at required freq	uency?	X							
		Were LCS (and LCSD, if applicable)		X							
			data document the laboratory's capability to								
		detect the COCs at the MDL used to		X				5			
		Was the LCSD RPD within QC limits				Х					
R7	OI	Matrix spike (MS) and matrix spike									
		Were the project/method specified an		Х	П	П	Г				
		Were MS/MSD analyzed at the appro		X							
		Were MS (and MSD, if applicable) %		†	Х			4			
		Were the MS/MSD RPDs within labor		X	Ė			Ė			
R8	OI	Analytical duplicate data	•								
	-	Were appropriate analytical duplicate	s analyzed for each matrix?	Х	ı	l	ı				
		Were analytical duplicates analyzed a		X							
			ations within the laboratory QC limits?	X							
R9	OI	Method quantitation limits (MQLs):	·								
	T -		e included in the laboratory data package?	Х							
			entration of the lowest non-zero calibration	X							
			uded in the laboratory data package?	† · ·	Х			2			
R10	OI	Other problems/anomalies	,								
	T		ecial conditions noted in this LRC and ER?	Х							
			logy used to lower the SDL to minimize the	X							
			nder the Texas Laboratory Accreditation	T iii							
		*	nd methods associated with this laboratory	X				3			
	1	data package?		1	l	1	l	1 -			



Laboratory Name:		Accutest Gulf Coast	12/12/2012					
Project Na		Quarterly Well Sampling, Parker Laboratory Project Number:		TC20881				
Reviewer	Name:	Anita Patel	Prep Batch Number(s):	GSS	233,	VK5	78	
#1	A ²	DESCRIPTION		YES	ΙΝΟ	NA ³	NR⁴	ER#5
S1	OI	Initial calibration (ICAL)						
			e response factors for each analyte within QC	\ \ \	П			
		limits?	•	X				
		Were percent RSDs or correlation co	efficient criteria met?	Х				
		Was the number of standards recom	mended in the method used for all analytes?	Х				
		Were all points generated between the	ne lowest and highest standard used to	X				
		calculate the curve?		_ ^				
		Are ICAL data available for all instrum		Х				
		Has the initial calibration curve been	verified using an appropriate second source	X				
		standard?						
S2	OI		erification (ICCV AND CCV) and continuing					
		Was the CCV analyzed at the metho	Х					
		Were percent differences for each an	alyte within the method-required QC limits?	Х				
		Was the ICAL curve verified for each	Х					
		Was the absolute value of the analyte			X			
S3	0	Mass spectral tuning						
		Was the appropriate compound for the		X				
	Were ion abundance data within the method-required QC limits?							
S4	0	Internal standards (IS)						
		Were IS area counts and retention tir	Х					
S5	OI	Raw data (NELAC Section 5.5.10)						
, , , ,			matograms, spectral data) reviewed by an	l x				
		analyst?		X				
	Were data associated with manual integrations flagged on the raw data?							
S6	0	Dual column confirmation			X	_		
		Did dual column confirmation results meet the method-required QC?						
S7	0	Tentatively identified compounds				1	1	
			ss spectra and TIC data subject to appropriate			Х		
S8		checks?						
	- 1	Interference Check Sample (ICS) r				l v	_	
S9	<u> </u>	Were percent recoveries within meth	kes, and method of standard additions			Х		
39			, and the linearity within the QC limits			1		
		specified in the method?	, and the inteanty within the QC limits			Х		
S10	OI	Method detection limit (MDL) studi	ine					
310	- 01	Was a MDL study performed for each		Х				
		Is the MDL either adjusted or suppor		X				5
S11	OI	Proficiency test reports	tod by the dridiyold of Beecs.	^				j
	<u> </u>		ceptable on the applicable proficiency tests or		П			
		evaluation studies?	copiable on the applicable proficiency tools of	Х				
S12	OI	Standards documentation						
	<u> </u>		es NIST-traceable or obtained from other		П	l	<u> </u>	
		appropriate source?		X				
S13	OI	Compound/analyte identification p	rocedures					
		Are the procedures for compound/an		Х	П			
S14	OI	Demonstration of analyst compete	,					
_		Was DOC conducted consistent with		Х		Ī	Ī	
		Is documentation of the analyst's con	•	X				
S15	OI		tion for methods (NELAC Chapter 5)					
2	T -		the data documentated, verified, and					
		validated, where applicable?		X				
S16	OI	Laboratory standard operating pro	ocedures (SOPs)					
		Are laboratory SOPs current and on the		Х				
		•	•	•	-			



	LABOR	RATORY REVIEW CHEC	KLIST (continued): Exception	n Reports							
Laboratory	Name:	Accutest Gulf Coast	LRC Date:	12/12/2012							
Project Na	me:	Quarterly Well Sampling, Parker	Laboratory Project Number:	TC20881							
Reviewer	Name:	Anita Patel	Prep Batch Number(s):	GSS233, VK578							
ER# ¹	Description										
	For reporting purposes, the MQL is defined in the report as the RL. The unadjusted MQL/RL is reported in the method										
1	blank. The	SDL is defined in the report as the MI	DL.								
	For reporting purposes, the method blank represents the unadjusted MQL. The DCS is on file in the laboratory and is not										
2	included in the laboratory data package.										
	The labora	tory is NELAC-accredited under the T	exas Laboratory Accreditation Program for the	analytes, matrices, and							
3	methods a	ssociated with this laboratory data pac	kage for analytes that are listed in the Texas F	ields of Accreditation.							
4	All anomal	ies are discussed in the case narrative	<b>9.</b>								
	1	, ,	or Method RSKSOP-147/175. The component	s reported are not listed or							
5	do not hav	e values in the Texas TRRP PCL table	es.								

1ER# = Exception Report identification number (an Exception Report should be completed for an item if "NR" or "No" is checked on





# GC/MS Volatiles

QC Data Summaries

Includes the following where applicable:

- Method Blank Summaries
- Blank Spike Summaries
- Matrix Spike and Duplicate Summaries



**Method:** SW846 8260B

# Method Blank Summary Job Number: TC20881

Job Number:

PESTXST EarthCon Consultants **Account:** 

Quarterly Well Sampling, Parker County, Texas **Project:** 

Sample VK578-MB	<b>File ID</b> K13177.D	<b>DF</b> 1	<b>Analyzed</b> 12/06/12	By EM	Prep Date n/a	Prep Batch n/a	Analytical Batch VK578

### The QC reported here applies to the following samples:

CAS No.	Compound	Result	RL	MDL	Units Q
71-43-2	Benzene	ND	1.0	0.34	ug/l
100-41-4	Ethylbenzene	ND	1.0	0.32	ug/l
108-88-3	Toluene	ND	1.0	0.33	ug/l
1330-20-7	Xylene (total)	ND	3.0	0.87	ug/l

CAS No.	<b>Surrogate Recoveries</b>	Limits	
1868-53-7	Dibromofluoromethane	107%	72-122%
17060-07-0	1,2-Dichloroethane-D4	105%	68-124%
2037-26-5	Toluene-D8	107%	80-119%
460-00-4	4-Bromofluorobenzene	103%	72-126%



**Method:** SW846 8260B

# Blank Spike Summary Job Number: TC20881

PESTXST EarthCon Consultants Account:

Quarterly Well Sampling, Parker County, Texas **Project:** 

Sample	File ID	DF	Analyzed	By	<b>Prep Date</b>	Prep Batch	Analytical Batch
VK578-BS	K13175.D	1	12/06/12	EM	n/a	n/a	VK578

The QC reported here applies to the following samples:

CAS No.	Compound	Spike ug/l	BSP ug/l	BSP %	Limits
71-43-2	Benzene	25	23.5	94	68-119
100-41-4	Ethylbenzene	25	23.4	94	71-117
108-88-3	Toluene	25	23.0	92	73-119
1330-20-7	Xylene (total)	75	71.7	96	74-119

CAS No.	Surrogate Recoveries	BSP	Limits
1868-53-7	Dibromofluoromethane	105%	72-122%
17060-07-0	1,2-Dichloroethane-D4	103%	68-124%
2037-26-5	Toluene-D8	105%	80-119%
460-00-4	4-Bromofluorobenzene	101%	72-126%



^{* =} Outside of Control Limits.

# 6.3.1

Page 1 of 1

**Method:** SW846 8260B

# Matrix Spike/Matrix Spike Duplicate Summary

Job Number: TC20881

**Account:** PESTXST EarthCon Consultants

**Project:** Quarterly Well Sampling, Parker County, Texas

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	<b>Analytical Batch</b>
TC20506-1MS	K13179.D	1	12/06/12	EM	n/a	n/a	VK578
TC20506-1MSD	K13180.D	1	12/06/12	EM	n/a	n/a	VK578
TC20506-1	K13178.D	1	12/06/12	EM	n/a	n/a	VK578

The QC reported here applies to the following samples:

CAS No.	Compound	TC20506-1 ug/l Q	Spike ug/l	MS ug/l	MS %	MSD ug/l	MSD %	RPD	Limits Rec/RPD
71-43-2	Benzene	ND	25	23.4	94	23.1	92	1	68-119/12
100-41-4	Ethylbenzene	ND	25	22.9	92	22.6	90	1	71-117/12
108-88-3	Toluene	ND	25	23.0	92	22.1	88	4	73-119/13
1330-20-7	Xylene (total)	ND	75	71.6	95	69.3	92	3	74-119/13

CAS No.	<b>Surrogate Recoveries</b>	MS	MSD	TC20506-1	Limits
1868-53-7	Dibromofluoromethane	108%	108%	105%	72-122%
17060-07-0	1,2-Dichloroethane-D4	103%	105%	104%	68-124%
2037-26-5	Toluene-D8	107%	105%	106%	80-119%
460-00-4	4-Bromofluorobenzene	103%	104%	104%	72-126%



^{* =} Outside of Control Limits.



# GC Volatiles

# QC Data Summaries

## Includes the following where applicable:

- Method Blank Summaries
- Blank Spike Summaries
- Matrix Spike and Duplicate Summaries



Method: RSKSOP-147/175

# Method Blank Summary Job Number: TC20881

Account: PESTXST EarthCon Consultants

Quarterly Well Sampling, Parker County, Texas **Project:** 

Sample GSS233-MB	File ID SS005056.D	<b>DF</b> 1	<b>Analyzed</b> 12/07/12	By LT	<b>Prep Date</b> n/a	<b>Prep Batch</b> n/a	Analytical Batch GSS233

The QC reported here applies to the following samples:

CAS No.	Compound	Result	RL	MDL	Units Q
74-82-8	Methane	ND	0.50	0.30	ug/l
74-85-1	Ethene	ND	1.0	0.50	ug/l
74-84-0	Ethane	ND	1.0	0.50	ug/l
74-98-6	Propane	ND	1.5	0.75	ug/l
75-28-5	Isobutane	ND	1.5	0.75	ug/l
106-97-8	Butane	ND	1.5	0.75	ug/l



Method: RSKSOP-147/175

# Blank Spike Summary Job Number: TC20881

Account: PESTXST EarthCon Consultants

Quarterly Well Sampling, Parker County, Texas **Project:** 

Sample GSS233-BS	<b>File ID</b> SS005054.D	<b>DF</b> 1	<b>Analyzed</b> 12/07/12	By LT	<b>Prep Date</b> n/a	<b>Prep Batch</b> n/a	Analytical Batch GSS233

The QC reported here applies to the following samples:

CAS No.	Compound	Spike ug/l	BSP ug/l	BSP %	Limits
74-82-8	Methane	21.5	16.2	75	68-139
74-85-1	Ethene	57.4	43.2	75	52-145
74-84-0	Ethane	43.3	47.1	109	68-131
74-98-6	Propane	60.6	60.5	100	69-131
75-28-5	Isobutane	72.5	70.4	97	72-131
106-97-8	Butane	76.6	73.6	96	66-128



^{* =} Outside of Control Limits.

Method: RSKSOP-147/175

# **Matrix Spike Summary**

Job Number: TC20881

**Account:** PESTXST EarthCon Consultants

**Project:** Quarterly Well Sampling, Parker County, Texas

Sample TC20970-2MS ^a TC20970-2 ^a	<b>File ID</b> SS005067.D SS005066.D	<b>Analyzed</b> 12/07/12 12/07/12	By LT LT	Prep Date n/a n/a	Prep Batch n/a n/a	Analytical Batch GSS233 GSS233

The QC reported here applies to the following samples:

CAS No.	Compound	TC20970-2 ug/l Q	Spike ug/l	MS ug/l	MS %	Limits
74-82-8	Methane	105	21.5	95.8	-42* b	68-139
74-85-1	Ethene	ND	57.4	46.6	81	52-145
74-84-0	Ethane	4.71	43.3	46.7	97	68-131
74-98-6	Propane	ND	60.6	53.4	88	69-131
75-28-5	Isobutane	ND	72.5	61.8	85	72-131
106-97-8	Butane	ND	76.6	66.0	86	66-128

⁽a) Sample was not preserved to a pH < 2.



⁽b) Outside control limits due to high level in sample relative to spike amount.

^{* =} Outside of Control Limits.

Method: RSKSOP-147/175

# **Duplicate Summary Job Number:** TC20881

PESTXST EarthCon Consultants Account:

**Project:** Quarterly Well Sampling, Parker County, Texas

Sample TC20879-1DUP TC20879-1	File ID SS005062.D SS005061.D	Analyzed 12/07/12 12/07/12	By LT LT	Prep Date n/a n/a	Prep Batch n/a n/a	Analytical Batch GSS233 GSS233

The QC reported here applies to the following samples:

CAS No.	Compound	TC20879-1 ug/l Q	DUP ug/l Q	RPD	Limits
74-82-8	Methane	4.10	3.34	20	53
74-85-1	Ethene	1.0 U	ND	nc	27
74-84-0	Ethane	1.0 U	ND	nc	43
74-98-6	Propane	1.5 U	ND	nc	21
75-28-5	Isobutane	1.5 U	ND	nc	35
106-97-8	Butane	1.5 U	ND	nc	33



^{* =} Outside of Control Limits.



## ANALYSIS REPORT

Lab #: 321088 Job #: 20030

Sample Name/Number: WW25-Mat-120212
Company: Oil Tracers, LLC

Date Sampled: 12/02/2012

Container: Dissolved Gas Bottle

Field/Site Name: Third Quarter Well Sampling

Location: Parker County, Texas

Formation/Depth:

Sampling Point:

Date Received: 12/05/2012 Date Reported: 2/01/2013

Component	Chemical	$\delta^{13}C$	$\delta D$	$\delta^{18}$ O
	mol. %	%	%。	‰
Carbon Monoxide	0.065			
Hydrogen Sulfide	na			
Helium	na			
Hydrogen	nd			
Argon	1.64			
Oxygen	15.11			
Nitrogen	82.80			
Carbon Dioxide	0.31			
Methane	0.0674			
Ethane	0.0023			
Ethylene	nd			
Propane	0.0009			
Propylene	nd			
Iso-butane	nd			
N-butane	nd			
Iso-pentane	nd			
N-pentane	nd			
Hexanes +	0.0005			

#### Remarks:

Analysis is of gas extracted from water by headspace equilibration. Analysis has been corrected for helium added to create headspace. Helium dilution factor = 0.78

nd = not detected. na = not analyzed. Isotopic composition of hydrogen is relative to VSMOW. Isotopic composition of carbon is relative to VPDB. Isotopic composition of oxygen is relative to VSMOW, except for carbon dioxide which is relative to VPDB. Calculations for BTU and specific gravity per ASTM D3588. Chemical compositions are normalized to 100%. Mol. % is approximately equal to vol. %.

^{*}Addition of helium negates the ability to detect native helium and may negate the ability to detect hydrogen.



12/12/12



# Technical Report for

EarthCon Consultants

Quarterly Well Sampling, Parker County, Texas

3rd Quarter / WW7-Mer

Accutest Job Number: TC20871

Sampling Date: 11/30/12

### Report to:

EarthCon Consultants 4800 Sugar Grove Suite 420 Stafford, TX 77477

gfloreslovo@earthcon.com; djackson@jacksonsjoberg.com; mcpatton@rangeresources.com; escott@earthcon.com

ATTN: Gabriela Floreslovo

Total number of pages in report: 26



Test results contained within this data package meet the requirements of the National Environmental Laboratory Accreditation Conference and/or state specific certification programs as applicable.

Richard Rollriguez Laboratory Director

Client Service contact: Elessa Sommers 713-271-4700

Certifications: TX (T104704220-12-8) AR (11-028-0) AZ (AZ0769) FL (E87628) KS (E-10366) LA (85695/04004) OK (211-035)

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# **Sample Summary**

EarthCon Consultants

Job No: TC20871

Quarterly Well Sampling, Parker County, Texas Project No: 3rd Quarter / WW7-Mer

Sample Collected			Matr		Client	
Number	Date	Time By	Received	Code	Туре	Sample ID
TC20871-1	11/30/12	10:30	12/04/12	AQ	Ground Water	WW7-MER-113012





### SAMPLE DELIVERY GROUP CASE NARRATIVE

Client: EarthCon Consultants Job No TC20871

Site: Quarterly Well Sampling, Parker County, Texas Report Date 12/12/2012 12:05:56 P

1 Sample was collected on 11/30/2012 and received intact at Accutest on 12/04/2012 and properly preserved in 1 cooler at 2.4 Deg C. The sample received an Accutest job number of TC20871. A listing of the Laboratory Sample ID, Client Sample ID and date of collection are presented in the Results Summary Section of this report.

Except as noted below, all method specified calibrations and quality control performance criteria were met for this job. For more information, please refer to QC summary pages.

### Volatiles by GCMS By Method SW846 8260B

Matrix AQ Batch ID: VX1673

- All samples were analyzed within the recommended method holding time.
- All method blanks for this batch meet method specific criteria.
- Sample(s) TC20864-1MS, TC20864-1MSD were used as the QC samples indicated.

### Volatiles by GC By Method RSKSOP-147/175

Matrix AQ Batch ID: GSS232

- All samples were analyzed within the recommended method holding time.
- All method blanks for this batch meet method specific criteria.
- Sample(s) TC20890-1DUP, TC20890-1MS were used as the QC samples indicated.
- Matrix Spike Recovery(s) for Ethene, Propane are outside control limits. Probable cause due to matrix interference.
- Matrix Spike Recovery(s) for Ethane, Methane are outside control limits. Outside control limits due to high level in sample relative to spike amount.
- RPD(s) for Duplicate for Butane, Isobutane, Propane are outside control limits for sample TC20890-1DUP.

Accutest Laboratories Gulf Coast (ALGC) certifies that this report meets the project requirements for analytical data produced for the samples as received at ALGC and as stated on the COC. ALGC certifies that the data meets the Data QualityObjectives for precision, accuracy and completeness as specified in the ALGC Quality Manual except as noted above. This report is to be used in its entirety. ALGC is not responsible for any assumptions of data quality if partial data packages are used



**Summary of Hits Job Number:** TC20871

Account: EarthCon Consultants

Quarterly Well Sampling, Parker County, Texas 11/30/12**Project:** 

Collected:

Lab Sample ID Analyte	Client Sample ID	Result/ Qual	MQL	SDL	Units	Method
TC20871-1	WW7-MER-1130	12				
Methane Ethane		1.63 0.0629	0.0050 0.0010	0.0030 0.00050	mg/l mg/l	RSKSOP-147/175 RSKSOP-147/175





Sample Results		
Report of Analysis		



### 4

# **Report of Analysis**

Client Sample ID: WW7-MER-113012

 Lab Sample ID:
 TC20871-1
 Date Sampled:
 11/30/12

 Matrix:
 AQ - Ground Water
 Date Received:
 12/04/12

 Method:
 SW846 8260B
 Percent Solids:
 n/a

**Project:** Quarterly Well Sampling, Parker County, Texas

	File ID	DF	Analyzed	By	<b>Prep Date</b>	Prep Batch	<b>Analytical Batch</b>
Run #1	X0087068.D	1	12/06/12	CF	n/a	n/a	VX1673
Run #2							

	Purge Volume	
Run #1	5.0 ml	
Run #2		

### **Purgeable Aromatics**

CAS No.	Compound	Result	MQL	SDL	Units	Q
71-43-2 108-88-3 100-41-4 1330-20-7	Benzene Toluene Ethylbenzene Xylene (total)	0.00034 U 0.00033 U 0.00032 U 0.00087 U	0.0010 0.0010 0.0010 0.0030	0.00034 0.00033 0.00032 0.00087	mg/l mg/l mg/l mg/l	
CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits		
1868-53-7 17060-07-0 2037-26-5 460-00-4	Dibromofluoromethane 1,2-Dichloroethane-D4 Toluene-D8 4-Bromofluorobenzene	104% 97% 97% 97%		72-122% 68-124% 80-119% 72-126%		

 $\begin{array}{ll} U = & Not \; detected & SDL \; - \; Sample \; Detection \; Limit \\ MQL = & Method \; Quantitation \; Limit \\ \end{array}$ 

E = Indicates value exceeds calibration range

J = Indicates an estimated value

B = Indicates analyte found in associated method blank N = Indicates presumptive evidence of a compound



### 4

# **Report of Analysis**

Client Sample ID: WW7-MER-113012

 Lab Sample ID:
 TC20871-1
 Date Sampled:
 11/30/12

 Matrix:
 AQ - Ground Water
 Date Received:
 12/04/12

 Method:
 RSKSOP-147/175
 Percent Solids:
 n/a

**Project:** Quarterly Well Sampling, Parker County, Texas

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	<b>Analytical Batch</b>
Run #1	SS005034.D	1	12/06/12	LT	n/a	n/a	GSS232
Run #2	SS005036.D	10	12/06/12	LT	n/a	n/a	GSS232

### **RSK147 Special List**

CAS No.	Compound	Result	MQL	SDL	Units	Q
74-82-8	Methane	1.63 a	0.0050	0.0030	mg/l	
74-85-1	Ethene	0.00050 U	0.0010	0.00050	mg/l	
74-84-0	Ethane	0.0629	0.0010	0.00050	mg/l	
74-98-6	Propane	0.00075 U	0.0015	0.00075	mg/l	
75-28-5	Isobutane	0.00075 U	0.0015	0.00075	mg/l	
106-97-8	Butane	0.00075 U	0.0015	0.00075	mg/l	

(a) Result is from Run# 2

U = Not detected

SDL - Sample Detection Limit

 $MQL = \ Method \ Quantitation \ Limit$ 

E = Indicates value exceeds calibration range

J = Indicates an estimated value

B = Indicates analyte found in associated method blank N = Indicates presumptive evidence of a compound





Misc. Forms

Custody Documents and Other Forms

Includes the following where applicable:

- Chain of Custody
- LRC Form



Good Land Complement & Sure Complete H +					10165 Harrin Dr. Sta 150 Houston, TV 77036								FE	FED-EX Tracking #						Bottle Order Control #						
Laboratories	10165 Harwin Dr., Ste 150 Houston, TX 77036 TEL. 713-271-4700 FAX: 713-271-4770									Ac	cutest 0	Quote #				-	Accutest Job#					387H				
	to a second second	www.accutest.com  Project Information										3		- d	I Analyses					Matrix Codes						
Client / Reporting Information	n	Design Alexander		Project	Informa	tion	100	100 P	20,985	804023			S PHARMS	22503	—т			v e y	uest	eu	<u> </u>	yse			$\neg$	WIGHTA COUCE
Company Name		Project Name:													- 1	اتما							1			
EarthCon Consultants, Inc.		Third Quarter	ly Well Samplii	og. Parker (	County.	Texas										Ethene, Isobutane, Methane, -175							120			DW - Drinking Water
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2.																										

TC20871: Chain of Custody
Page 1 of 4







### **Accutest Laboratories Sample Receipt Summary**

Accutest Job Number: TC20	871	Client:	EARTHCO	N CON	SULTANT	S	Project:	3RD QTR WEL	L SAMPLI	NG,PAI	RKER CO	JUNTY,T
Date / Time Received: 12/4/2012			Delivery M	ethod:	d: Client		Airbill #'s:					
No. Coolers: 1	Therm ID:	IR6					Temp Adjus	tment Factor:	0.2			
Cooler Temps (Initial/Adjuste	d): #1: (2.2	/2.4)										
Cooler Security Y	or N			Υo	r N_	Sample Integr	ity - Docume	ntation_	Υ	or I	N_	
1. Custody Seals Present:		3. COC P		<b>✓</b>		Sample label	s present on bo	ttles:	<b>✓</b>			
2. Custody Seals Intact:   ✓	_ 4.	Smpl Date	s/Time OK	<b>✓</b>		2. Container lab	eling complete:		<b>✓</b>			
Cooler Temperature	Y or N	<u>L</u>				3. Sample conta	ainer label / CO	C agree:	<b>✓</b>			
1. Temp criteria achieved:	<b>v</b>					Sample Integ	rity - Conditio	on	Υ	or I	N_	
Cooler temp verification:	Infared G	un				Sample recvo	d within HT:		<b>✓</b>			
Cooler media:	Ice (baç	3)				2. All containers	s accounted for:		<b>✓</b>			
<b>Quality Control Preservation</b>	Y or l	N N/A	<u>. 1</u>	WTB	STB	3. Condition of	sample:			Intact		
1. Trip Blank present / cooler:	<b>V</b>			<b>✓</b>		Sample Integ	rity - Instructi	ons	Υ	or N	l N/	Α
2. Trip Blank listed on COC:							uested is clear:		<u> </u>			_
3. Samples preserved properly:	<b>V</b>						ived for unspeci			<u> </u>		
4. VOCs headspace free:	<b>v</b>					3. Sufficient vo	lume recvd for a	analysis:	<b>✓</b>		]	
						4. Compositing	instructions cle	ear:			] [	<b>Z</b>
						5. Filtering inst	ructions clear:				] [	Z
Comments - Received trip blank	not listed on	COC.										

TC20871: Chain of Custody Page 2 of 4

Page 1 of 3







### **Problem Resolution**

Accutest Job Number: TC20871

CSR: Elessa Sommers

Response: Trip blank is on separate report.

Response Date: 12/5/2012

7

TC20871: Chain of Custody
Page 3 of 4







#### Sample Receipt Log

 Job #:
 TC20871
 Date / Time Received:
 12/4/2012 9:22:00 AM
 Initials:
 CH

Client: EARTHCON CONSULTANTS

Cooler #	Sample ID:	Vol	Bot #	Location	Pres	рН	Therm ID	Initial Temp	Therm CF	Corrected Temp
1	TC20871-1	40ml	1	VR	HCL	Note #1 - Preservative to be checked by analyst at the instrument.	IR6	2.2	0.2	2.4
1	TC20871-1	40ml	2	VR	HCL	Note #1 - Preservative to be checked by analyst at the instrument.	IR6	2.2	0.2	2.4
1	TC20871-1	40ml	3	VR	HCL	Note #1 - Preservative to be checked by analyst at the instrument.	IR6	2.2	0.2	2.4
1	TC20871-1	40ml	4	VR	HCL	Note #1 - Preservative to be checked by analyst at the instrument.	IR6	2.2	0.2	2.4
1	TC20871-1	40ml	5	VR	HCL	Note #1 - Preservative to be checked by analyst at the instrument.	IR6	2.2	0.2	2.4
1	TC20871-1	40ml	6	VR	HCL	Note #1 - Preservative to be checked by analyst at the instrument.	IR6	2.2	0.2	2.4

TC20871: Chain of Custody

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#### Laboratory Data Package Cover Page Appendix A

This signature page, the laboratory review checklist, and the following reportable data:

TC20871 This data package consists of

[]

QA Manager Name (Printed)

Richard Rodriguez

Signature

į.	R1	Field chain-of-custody documentation	J;
	R2	Sample identification cross-reference	
	R3	Test reports (analytical data sheets) for	or each environmental sample that includes:
		a)	Items consistent with NELAC 5.13 or ISO/IEC 17025 Section 5.10
		b)	dilution factors,
		c)	preparation methods,
		d)	cleanup methods, and
		e)	if required for the project, tentatively identified compounds (TICs).
	R4	Surrogate recovery data including:	
		a)	Calculated recovery (%R), and
		b)	The laboratory's surrogate QC limits.
	R5	Test reports/summary forms for blank	samples;
	R6	Test reports/summary forms for labor	atory control samples (LCSs) including:
		a)	LCS spiking amounts,
		b)	Calculated %R for each analyte, and
		c)	The laboratory's LCS QC limits.
Ģ	R7	Test reports for project matrix spike/m	natrix spike duplicates (MS/MSDs) including:
		a)	Samples associated with the MS/MSD clearly identified,
		b)	MS/MSD spiking amounts,
		c)	Concentration of each MS/MSD analyte measured in the parent and
		d)	Calculated %Rs and relative percent differences (RPDs), and
		e)	The laboratory's MS/MSD QC limits
	R8	Laboratory analytical duplicate (if app	licable) recovery and precision:
		a)	The amount of analyte measured in the duplicate,
		b)	The calculated RPD, and
		c)	The laboratory's QC limits for analytical duplicates.
	R9	List of method quantitation limits (MQ	Ls) and detectability check sample results for each analyte for each
Ģ	R10	Other problems or anomalies.	
		, ,	item in Laboratory Review Checklist and for each analyte, matrix, and
metnoa to	r wnich the i	laboratory does not hold NELAC accre	ditation under the Texas Laboratory Accreditation Program.
Texas Lab the Excep requirement affirm to the the data, he withheld.	poratory Acc tion Report. ents of the mane best of managery mave been id	reditation Program for all the methods, This data package has been reviewed ethods used, except where noted by th y knowledge, all problems/anomalies, of lentified by the laboratory in the Labora	laboratory data package. This laboratory is NELAC accredited under the analytes, and matrices reported in this data package except as noted in by the laboratory and is complete and technically compliant with the le laboratory in the attached exception reports. By my signature below, I observed by the laboratory as having the potential to affect the quality of atory Review Checklist, and no information or data have been knowingly
	applicable:		nder 30 TAC&25.6 and was last inspection by
[]		noted in the Exception Reports herein	011. Any findings affecting the data in this laboratory data package are n. The official signing the cover page of the report in which these data are data package and is by signature affirming the above release statement

Official Title (printed)

Laboratory Director

Date 12/12/2012



	L	ABORATORY REVIEW CHECKLIST: REPORTABLE	DAT	Ά			
Laboratory	/ Name:	Accutest Gulf Coast LRC Date:	12/	/12/2	012		
		Quarterly Well Sampling, Parker					
Project Na		County, Texas Laboratory Project Number:	+	2087			
Reviewer	Name:	Anita Patel Prep Batch Number(s):	GSS				
# ¹	A²	DESCRIPTION	YES	NO	NA°	NR⁴	ER #5
R1	OI	CHAIN-OF-CUSTODY (C-O-C):					
		Did samples meet the laboratory's standard conditions of sample acceptability	X				İ
		upon receipt?	X				-
		Were all departures from standard conditions described in an exception report?	X				
R2	OI	Sample and quality control (QC) identification	X				
	Are all field sample ID numbers cross-referenced to the laboratory ID numbers?						-
	Are all laboratory ID numbers cross-referenced to the corresponding QC data?						
R3	OI	Test reports					
		Were samples prepared and analyzed within holding times?	X				<u> </u>
		Other than those results <mql, all="" bracketed="" by="" calibration<="" other="" raw="" td="" values="" were=""><td>Х</td><td></td><td></td><td></td><td>İ</td></mql,>	Х				İ
		standards? Were calculations checked by a peer or supervisor?	X				<b>-</b>
		Were all analyte identifications checked by a peer or supervisor?	X				<del>                                     </del>
		Were sample detection limits reported for all analytes not detected?	l x				<del>                                     </del>
		Were all results for soil and sediment samples reported on a dry weight basis?	+^		Х		
		Were % moisture (or solids) reported for all soil and sediment samples?	+		X		
		Were bulk soils/solids samples for volatile analysis extracted with methanol per	+				
		SW846 Method 5035?			Х		İ
		If required for the project, are TIC's reported?					
R4	0	Surrogate recovery data					
		Were surrogates added prior to extraction?					
		Were surrogate percent recoveries in all samples within the laboratory QC limits?	Х				
R5							
		Were appropriate type(s) of blanks analyzed?	Х				
		Were blanks analyzed at the appropriate frequency?	X				
	Were method blanks taken through the entire analytical process, including		l x				İ
		preparation and, if applicable, cleanup procedures?	<del>                  _       _     _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _</del>				-
R6	OI	Were blank concentrations <mql? (lcs):<="" control="" laboratory="" samples="" td=""><td>X</td><td>_</td><td></td><td></td><td>_</td></mql?>	X	_			_
- 10	01	Were all COCs included in the LCS?	X				
		Was each LCS taken through the entire analytical procedure, including prep and					
		cleanup steps?	Х				İ
		Were LCSs analyzed at required frequency?	X				
		Were LCS (and LCSD, if applicable) %Rs within the laboratory QC limits?	X				
		Does the detectability check sample data document the laboratory's capability to					_
		detect the COCs at the MDL used to calculate the SDLs?	X				5
		Was the LCSD RPD within QC limits?			Χ		
R7	OI	Matrix spike (MS) and matrix spike duplicate (MSD) data					
		Were the project/method specified analytes included in the MS and MSD?	Х				
		Were MS/MSD analyzed at the appropriate frequency?	Х				
		Were MS (and MSD, if applicable) %Rs within the laboratory QC Limits?		Х			4
		Were the MS/MSD RPDs within laboratory QC limits?	X				
R8	OI	Analytical duplicate data					
		Were appropriate analytical duplicates analyzed for each matrix?	X				<u> </u>
		Were analytical duplicates analyzed at the appropriate frequency?	X	L.			<u> </u>
		Were RPDs or relative standard deviations within the laboratory QC limits?		Х			4
R9	OI	Method quantitation limits (MQLs):	X				
	Are the MQLs for each method analyte included in the laboratory data package?  Do the MQLs correspond to the concentration of the lowest non-zero calibration						<del>                                     </del>
	Do the MQLs correspond to the concentration of the lowest non-zero calibration X  Are unadjusted MQLs and DCSs included in the laboratory data package? X						2
R10	OI	Other problems/anomalies					
	<del>  "</del>	Are all known problems/anomalies/special conditions noted in this LRC and ER?	Х				
		Was applicable and available technology used to lower the SDL to minimize the	T X				
		Is the laboratory NELAC-accredited under the Texas Laboratory Accreditation	Ť				
		Program for the analytes, matrices, and methods associated with this laboratory	X				3
		data package?	1				1
		•			_		



Laboratory	Name:	Accutest Gulf Coast LRC Date:				12/12/2012			
Project Na	me:	Quarterly Well Sampling, Parker Laboratory Project Number:				TC20871			
Reviewer		Anita Patel	Prep Batch Number(s):	GSS2	32 \	VX16	73		
#1	I A ²	DESCRIPTION	i rop Batori (amber(e).					ER#	
 S1	OI	Initial calibration (ICAL)		120	140	14/1	IVIX	LIX #	
31	01		e response factors for each analyte within QC		_				
		limits?	response factors for each analyte within QC	X					
		Were percent RSDs or correlation co	officient criteria met?	l x		_			
		·		X					
	Was the number of standards recommended in the method used for all analytes?  Were all points generated between the lowest and highest standard used to								
		calculate the curve?		l	_				
		Are ICAL data available for all instrum		X	-				
			verified using an appropriate second source	x					
		standard?		$\sqcup$					
S2	OI		erification (ICCV AND CCV) and continuing		_				
		Was the CCV analyzed at the method	X						
			alyte within the method-required QC limits?	X					
			Was the ICAL curve verified for each analyte?						
			concentration in the inorganic CCB <mdl?< td=""><td></td><td></td><td>Χ</td><td></td><td></td></mdl?<>			Χ			
S3	0	Mass spectral tuning							
	Was the appropriate compound for the method used for tuning?			X					
		Were ion abundance data within the method-required QC limits?							
S4	0	Internal standards (IS)							
		Were IS area counts and retention times within the method-required QC limits?							
S5	OI	Raw data (NELAC Section 5.5.10)							
		Were the raw data (for example, chro	matograms, spectral data) reviewed by an	x					
		analyst?		^					
		Were data associated with manual in	tegrations flagged on the raw data?	X					
S6	0	O Dual column confirmation							
		Did dual column confirmation results	meet the method-required QC?		П	Х			
S7	0	Tentatively identified compounds	TICs):						
			s spectra and TIC data subject to appropriate		П				
		checks?	, , , , , , , , , , , , , , , , , , , ,			Х			
S8	ı	Interference Check Sample (ICS) r	esults						
		Were percent recoveries within method			П	Х			
S9			kes, and method of standard additions						
			, and the linearity within the QC limits		П				
		specified in the method?	, ,			Х			
S10	OI	Method detection limit (MDL) studi	es						
	-	Was a MDL study performed for each		Х	П				
		Is the MDL either adjusted or support		X				5	
S11	OI	Proficiency test reports	54 2) the analysis of 2000.	<del>  ^  </del>					
	<u> </u>		ceptable on the applicable proficiency tests or		T				
		evaluation studies?		X					
S12	OI	Standards documentation							
	<del></del>		s NIST-traceable or obtained from other		T				
		appropriate source?	cc. haddable of obtained from other	X	ļ				
S13	OI	Compound/analyte identification p	rocedures						
313	<u> </u>	Are the procedures for compound/ana		ΧI					
S14	OI	Demonstration of analyst compete	•						
314	<u> </u>	Was DOC conducted consistent with		v I	1				
				X	$\dashv$				
C45	- 01	Is documentation of the analyst's com		_ ^					
S15	OI		ion for methods (NELAC Chapter 5)						
			the data documentated, verified, and	X	ļ				
		validated, where applicable?	(000)						
S16	OI	Laboratory standard operating pro		1					
ĺ	1	Are laboratory SOPs current and on f	ile for each method performed?	X					



	LABOR	RATORY REVIEW CHEC	KLIST (continued): Exception	n Reports				
Laboratory	Name:	Accutest Gulf Coast	LRC Date:	12/12/2012				
Project Na	me:	Quarterly Well Sampling, Parker	Laboratory Project Number:	TC20871				
Reviewer Name:		Anita Patel	Prep Batch Number(s):	GSS232, VX1673				
ER# ¹	Description							
	For reporting	ng purposes, the MQL is defined in the	e report as the RL. The unadjusted MQL/RL is	reported in the method				
1		SDL is defined in the report as the MI						
	For reporting purposes, the method blank represents the unadjusted MQL. The DCS is on file in the laboratory and is not							
2	included in the laboratory data package.							
	The laboratory is NELAC-accredited under the Texas Laboratory Accreditation Program for the analytes, matrices, and							
3		, ,	kage for analytes that are listed in the Texas F	ields of Accreditation.				
4		ies are discussed in the case narrative						
	1	, ,	or Method RSKSOP-147/175. The component	s reported are not listed or				
5	do not hav	e values in the Texas TRRP PCL table	es.					
l								

¹ER# = Exception Report identification number (an Exception Report should be completed for an item if "NR" or "No" is checked on



#### GC/MS Volatiles

QC Data Summaries

Includes the following where applicable:

- Method Blank Summaries
- Blank Spike Summaries
- Matrix Spike and Duplicate Summaries



**Method:** SW846 8260B

# Method Blank Summary Job Number: TC20871

PESTXST EarthCon Consultants **Account:** 

**Project:** Quarterly Well Sampling, Parker County, Texas

Sample VX1673-MB	<b>File ID</b> X0087062.D	<b>DF</b> 1	<b>Analyzed</b> 12/06/12	<b>By</b> CF	Prep Date n/a	Prep Batch n/a	Analytical Batch VX1673

#### The QC reported here applies to the following samples:

CAS No.	Compound	Result	RL	MDL	Units Q
71-43-2	Benzene	ND	1.0	0.34	ug/l
100-41-4	Ethylbenzene	ND	1.0	0.32	ug/l
108-88-3	Toluene	ND	1.0	0.33	ug/l
1330-20-7	Xylene (total)	ND	3.0	0.87	ug/l

CAS No.	<b>Surrogate Recoveries</b>		Limits
1868-53-7	Dibromofluoromethane	105%	72-122%
17060-07-0	1,2-Dichloroethane-D4	95%	68-124%
2037-26-5	Toluene-D8	99%	80-119%
460-00-4	4-Bromofluorobenzene	98%	72-126%



**Method:** SW846 8260B

## Blank Spike Summary Job Number: TC20871

PESTXST EarthCon Consultants Account:

Quarterly Well Sampling, Parker County, Texas **Project:** 

Sample VX1673-BS	<b>File ID</b> X0087060.D	<b>DF</b>	<b>Analyzed</b> 12/06/12	By CF	Prep Date n/a	Prep Batch n/a	Analytical Batch VX1673

The QC reported here applies to the following samples:

CAS No.	Compound	Spike ug/l	BSP ug/l	BSP %	Limits
71-43-2	Benzene	25	22.2	89	68-119
100-41-4	Ethylbenzene	25	22.1	88	71-117
108-88-3	Toluene	25	22.4	90	73-119
1330-20-7	Xylene (total)	75	67.7	90	74-119

CAS No.	<b>Surrogate Recoveries</b>	BSP	Limits
17060-07-0 2037-26-5	Dibromofluoromethane 1,2-Dichloroethane-D4 Toluene-D8	101% 99% 101%	72-122% 68-124% 80-119%
460-00-4	4-Bromofluorobenzene	92%	72-126%



^{* =} Outside of Control Limits.

## 6.3.1

Page 1 of 1

**Method:** SW846 8260B

#### σ

## Matrix Spike/Matrix Spike Duplicate Summary

Job Number: TC20871

**Account:** PESTXST EarthCon Consultants

**Project:** Quarterly Well Sampling, Parker County, Texas

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	<b>Analytical Batch</b>
TC20864-1MS	X0087064.D	1	12/06/12	CF	n/a	n/a	VX1673
TC20864-1MSD	X0087065.D	1	12/06/12	CF	n/a	n/a	VX1673
TC20864-1	X0087063.D	1	12/06/12	CF	n/a	n/a	VX1673

The QC reported here applies to the following samples:

CAS No.	Compound	TC20864-1 ug/l Q	Spike ug/l	MS ug/l	MS %	MSD ug/l	MSD %	RPD	Limits Rec/RPD
71-43-2	Benzene	1.0 U	25	23.0	92	22.4	90	3	68-119/12
100-41-4	Ethylbenzene	1.0 U	25	22.7	91	22.4	90	1	71-117/12
108-88-3	Toluene	1.0 U	25	22.9	92	22.5	90	2	73-119/13
1330-20-7	Xylene (total)	3.0 U	75	69.8	93	68.4	91	2	74-119/13

CAS No.	<b>Surrogate Recoveries</b>	MS	MSD	TC20864-1	Limits
1868-53-7	Dibromofluoromethane	103%	101%	105%	72-122%
17060-07-0	1,2-Dichloroethane-D4	98%	98%	96%	68-124%
2037-26-5	Toluene-D8	100%	100%	100%	80-119%
460-00-4	4-Bromofluorobenzene	91%	92%	98%	72-126%



^{* =} Outside of Control Limits.



#### GC Volatiles

QC Data Summaries

Includes the following where applicable:

- Method Blank Summaries
- Blank Spike Summaries
- Matrix Spike and Duplicate Summaries



Method: RSKSOP-147/175

# Method Blank Summary Job Number: TC20871

Account: PESTXST EarthCon Consultants

Quarterly Well Sampling, Parker County, Texas **Project:** 

Sample GSS232-MB	File ID SS005026.D	<b>DF</b> 1	<b>Analyzed</b> 12/06/12	By LT	<b>Prep Date</b> n/a	<b>Prep Batch</b> n/a	Analytical Batch GSS232

The QC reported here applies to the following samples:

CAS No.	Compound	Result	RL	MDL	Units Q
74-82-8	Methane	ND	0.50	0.30	ug/l
74-85-1	Ethene	ND	1.0	0.50	ug/l
74-84-0	Ethane	ND	1.0	0.50	ug/l
74-98-6	Propane	ND	1.5	0.75	ug/l
75-28-5	Isobutane	ND	1.5	0.75	ug/l
106-97-8	Butane	ND	1.5	0.75	ug/l



Method: RSKSOP-147/175

## Blank Spike Summary Job Number: TC20871

Account: PESTXST EarthCon Consultants

Quarterly Well Sampling, Parker County, Texas **Project:** 

Sample GSS232-BS	File ID SS005023.D	<b>DF</b> 1	<b>Analyzed</b> 12/06/12	By LT	Prep Date n/a	Prep Batch	Analytical Batch GSS232

The QC reported here applies to the following samples:

CAS No.	Compound	S _I ug	oike BSl g/l ug/		Limits
74-82-8	Methane	21	.5 21.	0 98	68-139
74-85-1	Ethene	57	7.4 54.	7 95	52-145
74-84-0	Ethane	43	3.3 56.	7 131	68-131
74-98-6	Propane	60	0.6 68.	2 113	69-131
75-28-5	Isobutane	72	2.5 77.	3 107	72-131
106-97-8	Butane	76	5.6 82.	4 108	66-128



^{* =} Outside of Control Limits.

Method: RSKSOP-147/175

#### **Matrix Spike Summary**

Job Number: TC20871

**Account:** PESTXST EarthCon Consultants

**Project:** Quarterly Well Sampling, Parker County, Texas

Sample	File ID	DF	Analyzed	Ву	Prep Date	Prep Batch	Analytical Batch
TC20890-1MS	SS005029.D	1	12/06/12	LT	n/a	n/a	GSS232
TC20890-1	SS005027.D	1	12/06/12	LT	n/a	n/a	GSS232
TC20890-1	SS005030.D	250	12/06/12	LT	n/a	n/a	GSS232

The QC reported here applies to the following samples:

CAS No.	Compound	TC20890-1 ug/l Q	Spike ug/l	MS ug/l	MS %	Limits
74-82-8	Methane	20100 b	21.5	17100	-13815	* <del>6</del> 8-139
74-85-1	Ethene	1.0 U	57.4	5540	9654*	52-145
74-84-0	Ethane	3500 b	43.3	4120	1431*	a 68-131
74-98-6	Propane	66.8	60.6	172	174*	69-131
75-28-5	Isobutane	8.41	72.5	93.3	117	72-131
106-97-8	Butane	10.3	76.6	101	119	66-128

⁽a) Outside control limits due to high level in sample relative to spike amount.



⁽b) Result is from Run #2.

^{* =} Outside of Control Limits.

Method: RSKSOP-147/175

# **Duplicate Summary Job Number:** TC20871

PESTXST EarthCon Consultants Account:

**Project:** Quarterly Well Sampling, Parker County, Texas

Sample	File ID	DF	Analyzed	Ву	Prep Date	Prep Batch	Analytical Batch
TC20890-1DUP	SS005028.D	1	12/06/12	LT	n/a	n/a	GSS232
TC20890-1	SS005027.D	1	12/06/12	LT	n/a	n/a	GSS232
TC20890-1	SS005030.D	250	12/06/12	LT	n/a	n/a	GSS232

The QC reported here applies to the following samples:

TC20871-1

CAS No.	Compound	TC20890-1 ug/l Q	DUP ug/l	Q	RPD	Limits
74-82-8	Methane	20100 a	16400	E	21	53
74-85-1	Ethene	1.0 U	ND		nc	27
74-84-0	Ethane	3500 a	4020	E	14	43
74-98-6	Propane	66.8	99.1		39*	21
75-28-5	Isobutane	8.41	12.1		36*	35
106-97-8	Butane	10.3	15.1		38*	33

(a) Result is from Run #2.



^{* =} Outside of Control Limits.



#### ANALYSIS REPORT

Lab #: 321079 Job #: 20030

Sample Name/Number: WW7-Mer-113012
Company: Oil Tracers, LLC
Date Sampled: 11/30/2012

Container: Dissolved Gas Bottle

Field/Site Name: Third Quarter Well Sampling

Location: Parker County, Texas

Formation/Depth:

Sampling Point:

Date Received: 12/05/2012 Date Reported: 2/01/2013

Component	Chemical mol. %	δ ¹³ C ‰	δD ‰	δ ¹⁸ Ο ‰
Carbon Monoxide	nd			
Hydrogen Sulfide	na			
Helium	na			
Hydrogen	nd			
Argon	1.51			
Oxygen	0.14			
Nitrogen	80.41			
Carbon Dioxide	0.25			
Methane	17.48	-43.15	-138.4	
Ethane	0.210	-14.3		
Ethylene	nd			
Propane	nd			
Propylene	nd			
Iso-butane	nd			
N-butane	0.0004			
Iso-pentane	0.0008			
N-pentane	nd			
Hexanes +	nd			

#### Remarks:

Analysis is of gas extracted from water by headspace equilibration. Analysis has been corrected for helium added to create headspace. Helium dilution factor = 0.76

nd = not detected. na = not analyzed. Isotopic composition of hydrogen is relative to VSMOW. Isotopic composition of carbon is relative to VPDB. Isotopic composition of oxygen is relative to VSMOW, except for carbon dioxide which is relative to VPDB. Calculations for BTU and specific gravity per ASTM D3588. Chemical compositions are normalized to 100%. Mol. % is approximately equal to vol. %.

^{*}Addition of helium negates the ability to detect native helium and may negate the ability to detect hydrogen.

^{**} Ethane isotopes obtained online via GC-C-IRMS



12/12/12



#### Technical Report for

EarthCon Consultants

Quarterly Well Sampling, Parker County, Texas

3rd Quarter / WW2-Pur

Accutest Job Number: TC20890

Sampling Date: 11/30/12

#### Report to:

EarthCon Consultants 4800 Sugar Grove Suite 420 Stafford, TX 77477

gfloreslovo@earthcon.com; djackson@jacksonsjoberg.com; mcpatton@rangeresources.com; escott@earthcon.com

ATTN: Gabriela Floreslovo

Total number of pages in report: 26



Test results contained within this data package meet the requirements of the National Environmental Laboratory Accreditation Conference and/or state specific certification programs as applicable.

Client Service contact: Elessa Sommers 713-271-4700

Certifications: TX (T104704220-12-8) AR (11-028-0) AZ (AZ0769) FL (E87628) KS (E-10366) LA (85695/04004) OK (211-035)

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Laboratory Director

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## **Sample Summary**

EarthCon Consultants

Job No:

TC20890

Quarterly Well Sampling, Parker County, Texas Project No: 3rd Quarter / WW2-Pur

Sample Number	Collected Date	Time By	Received	Matr Code		Client Sample ID
TC20890-1	11/30/12	15:25	12/04/12	AQ	Ground Water	WW2-PUR-113012
TC20890-1D	11/30/12	15:25	12/04/12	AQ	Water Dup/MSD	WW2-PUR-113012 MSD
TC20890-1S	11/30/12	15:25	12/04/12	AQ	Water Matrix Spike	WW2-PUR-113012 MS





#### SAMPLE DELIVERY GROUP CASE NARRATIVE

Client: EarthCon Consultants Job No TC20890

Site: Quarterly Well Sampling, Parker County, Texas Report Date 12/12/2012 12:12:02 P

1 Sample was collected on 11/30/2012 and received intact at Accutest on 12/04/2012 and properly preserved in 1 cooler at 2.4 Deg C. The sample received an Accutest job number of TC20890. A listing of the Laboratory Sample ID, Client Sample ID and date of collection are presented in the Results Summary Section of this report.

Except as noted below, all method specified calibrations and quality control performance criteria were met for this job. For more information, please refer to QC summary pages.

#### Volatiles by GCMS By Method SW846 8260B

Matrix AO Batch ID: VK579

- All samples were analyzed within the recommended method holding time.
- All method blanks for this batch meet method specific criteria.
- Sample(s) TC20890-1MS, TC20890-1MSD were used as the QC samples indicated.

#### Volatiles by GC By Method RSKSOP-147/175

Matrix AQ Batch ID: GSS232

- All samples were analyzed within the recommended method holding time.
- All method blanks for this batch meet method specific criteria.
- Sample(s) TC20890-1DUP, TC20890-1MS were used as the QC samples indicated.
- Matrix Spike Recovery(s) for Ethene, Propane are outside control limits. Probable cause due to matrix interference.
- Matrix Spike Recovery(s) for Ethane, Methane are outside control limits. Outside control limits due to high level in sample relative to spike amount.
- RPD(s) for Duplicate for Butane, Isobutane, Propane are outside control limits for sample TC20890-1DUP.

Accutest Laboratories Gulf Coast (ALGC) certifies that this report meets the project requirements for analytical data produced for the samples as received at ALGC and as stated on the COC. ALGC certifies that the data meets the Data QualityObjectives for precision, accuracy and completeness as specified in the ALGC Quality Manual except as noted above. This report is to be used in its entirety. ALGC is not responsible for any assumptions of data quality if partial data packages are used



**Summary of Hits Job Number:** TC20890

Account: EarthCon Consultants

Quarterly Well Sampling, Parker County, Texas 11/30/12**Project:** 

**Collected:** 

Lab Sample ID Analyte	Client Sample ID	Result/ Qual	MQL	SDL	Units	Method
TC20890-1	WW2-PUR-11301	2				
Benzene		0.00070 J	0.0010	0.00034	mg/l	SW846 8260B
Methane		20.1	0.13	0.075	mg/l	RSKSOP-147/175
Ethane		3.5	0.25	0.13	mg/l	RSKSOP-147/175
Propane		0.0668	0.0015	0.00075	mg/l	RSKSOP-147/175
Isobutane		0.00841	0.0015	0.00075	mg/l	RSKSOP-147/175
Butane		0.0103	0.0015	0.00075	mg/l	RSKSOP-147/175



Sample Results	
Report of Analysis	



#### **Report of Analysis**

Client Sample ID: WW2-PUR-113012

 Lab Sample ID:
 TC20890-1
 Date Sampled:
 11/30/12

 Matrix:
 AQ - Ground Water
 Date Received:
 12/04/12

 Method:
 SW846 8260B
 Percent Solids:
 n/a

**Project:** Quarterly Well Sampling, Parker County, Texas

	File ID	DF	Analyzed	By	<b>Prep Date</b>	<b>Prep Batch</b>	<b>Analytical Batch</b>	
Run #1	K13205.D	1	12/07/12	EM	n/a	n/a	VK579	
Run #2								

	Purge Volume	
Run #1	5.0 ml	
Run #2		

#### **Purgeable Aromatics**

CAS No.	Compound	Result	MQL	SDL	Units	Q
71-43-2 108-88-3 100-41-4 1330-20-7	Benzene Toluene Ethylbenzene Xylene (total)	0.00070 0.00033 U 0.00032 U 0.00087 U	0.0010 0.0010 0.0010 0.0030	0.00034 0.00033 0.00032 0.00087	mg/l mg/l mg/l mg/l	J
CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits		
1868-53-7 17060-07-0 2037-26-5 460-00-4	Dibromofluoromethane 1,2-Dichloroethane-D4 Toluene-D8 4-Bromofluorobenzene	109% 111% 105% 102%		72-122% 68-124% 80-119% 72-126%		

 $\begin{array}{ll} U = & Not \; detected & SDL \; - \; Sample \; Detection \; Limit \\ MQL = & Method \; Quantitation \; Limit \\ \end{array}$ 

E = Indicates value exceeds calibration range

J = Indicates an estimated value

B = Indicates analyte found in associated method blank N = Indicates presumptive evidence of a compound



#### **Report of Analysis**

Client Sample ID: WW2-PUR-113012

 Lab Sample ID:
 TC20890-1
 Date Sampled:
 11/30/12

 Matrix:
 AQ - Ground Water
 Date Received:
 12/04/12

 Method:
 RSKSOP-147/175
 Percent Solids:
 n/a

**Project:** Quarterly Well Sampling, Parker County, Texas

	File ID	DF	Analyzed	By	<b>Prep Date</b>	Prep Batch	<b>Analytical Batch</b>
Run #1	SS005027.D	1	12/06/12	LT	n/a	n/a	GSS232
Run #2	SS005030.D	250	12/06/12	LT	n/a	n/a	GSS232

#### **RSK147 Special List**

CAS No.	Compound	Result	MQL	SDL	Units	Q
74-82-8	Methane	20.1 a	0.13	0.075	mg/l	
74-85-1	Ethene	0.00050 U	0.0010	0.00050	mg/l	
74-84-0	Ethane	3.5 a	0.25	0.13	mg/l	
74-98-6	Propane	0.0668	0.0015	0.00075	mg/l	
75-28-5	Isobutane	0.00841	0.0015	0.00075	mg/l	
106-97-8	Butane	0.0103	0.0015	0.00075	mg/l	

(a) Result is from Run# 2

U = Not detected

SDL - Sample Detection Limit

MQL = Method Quantitation Limit

E = Indicates value exceeds calibration range

J = Indicates an estimated value

B = Indicates analyte found in associated method blank N = Indicates presumptive evidence of a compound





Misc. Forms

Custody Documents and Other Forms

Includes the following where applicable:

- · Chain of Custody
- LRC Form



CH	ΔIN	$\mathbf{OE}$	CHST	<b>FODY</b>

<b>67</b> 21			CHAI	N O	F (	CU	ST	O	D	ľ												PA	GE .		OF	
EACCUTEST:														F	ED-EX	Tracking	#			-	Bottle O	rder Conti	rol#			
Laboratoriex			10165 Har TEL, 713	win Dr, S 3-271-470					5					,	Accutes	t Quote #					Accutest	Job#	1		a Or	<u>a                                    </u>
From Management 2007	trood or the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control				accutest.c				450-1940													٠.	11		<u> </u>	$\Delta C$
Client / Reporting Information	5		Project	Informa	tion										_			Req	ues	ted	Ana	lyse	s		1	Matrix Codes
Company Name	Project Name:															ا يا										
EarthCon Consultants, Inc.		rly Well Sampli	ng, Parker C	County,	Texas											lane									DW	/ - Drinking Water
Street Address	Street				Variables.			8989	植灰藤					1000		leth								1	GV	V - Ground Water
4800 Sugar Grove Blvd., Suite 390 City State Zip	City		State	Billing I Compan	Informatio	on ( if	f differ	ent f	from F	tepor	rt to)			4		e,										WW - Water V - Surface Water
	City		Sidle	Compan	ly Name											ıtan				1						SO - Soil SL- Sludge
Stafford TX 77477 Project Contact E-mail	Project #			Street A	ddress									-1		ldo:										SED-Sediment
Gabriela Floreslovo																e, Is							-		L	OI - Oil IQ - Other Liquid
Phone # Fax #	Client Purchase	Order#	*****	City			-		State			Z	ip.			16 P							- 1		ء ا	AIR - Air OL - Other Solid
281-201-3513																표근							- 1			WP - Wipe
Sampler(s) Name(s) Phone #	Project Manager		,	Attention	1:										_	RS							1			FB-Field Blank
DB SH RM														_	8260B	Eth				l						
	-	Colle	tion	1	1	$\vdash$	Ŧ	Num	ber of p	reser	rved Bo	ottles	4 I iii	$\dashv$	82	ne, ane				1					$\vdash$	
Acculest Semple 8 Field ID / Point of Collection	Date	Time	Sampled By	Matrix	# of bottles	豆	NaOH ZA/NaO	HNO3	H2SO4	DI Wate	МЕОН	TSP	NaHSO	OTHER	BTEX	Butane, Ethane, Ethene, Isobutane, Methane, Propane by RSK-175							İ		L	AB USE ONLY
1 ww2-Pu1-113012	11/30/12	1525	JB	GU	18	K									X	×										
(MS/MSD)	-					1								Н										- 1		
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1																			<u> </u>							
									П		П	П	T	П							_					
Tumaround Time ( Business days)		grand de la company	1	1000	N .	لببل	Data	Deliv	verabl	e Inf	forma	ation		1 1						Com	ments	/ Specia	al Instruc	tions		
X Standard	Approved By (Acc	utest PM): / Date:			Commer	cial "	'A" (Le	evel	1)		X	TRE	RP.				=	-,,		16	lon	_	$\Sigma$		Me	MSD
5 Day RUSH				_	Commer				2)				D Fo	rmat			1	<u> </u>	4	v	1011	L	- 1/4	0.5	11)/	עבוייון
4 Day RUSH 3 Day RUSH					FULT1 ( REDT1 (							Oth	er		_											
☐ Z Day RUSH				-	Commer			,																	-	
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Emergency & Rush T/A data available VIA Lablink		, <i>®</i>					Comm																			
17-9	1-/2 69 Z	mple Custody m	ust be docum	nented h	elow ear	ch tir	Comm	nercia mn ¹ 4	el "C" : es ch:	= Res	sults +	+ QC	& Sur	inclu	e Sum	mary	delive	rv			\$12800G	0.619630	0986 W			
Reling lished by Sampler: Date Time	1	Received By:	)		-				linquisl						unig .	0041101	aciive	Date Ti	me:		Receive		SECTION OF	TO A TO THE LAND	ereuspel Schol	SHINDSCHOUT BURNING
Ralling listed by Sampler: Date Time	12 1553	11/				_		2	_	_											2					

TC20890: Chain of Custody Page 1 of 4







#### **Accutest Laboratories Sample Receipt Summary**

Accutest Job Number: TC20890	Client: EARTHCON	CONSULTANTS	Project:	3RD QTR WELL	SAMPLIN	IG,PARKE	R COUNTY,T
Date / Time Received: 12/4/2012	Delivery Me	ethod: Clien	Airbill #'s:				
No. Coolers: 1 Therm ID:	IR6		Temp Adjus	tment Factor:	0.2		
Cooler Temps (Initial/Adjusted): #1: (2.2	/2.4)			_			
Cooler Security Y or N			ole Integrity - Docume	<u>ntation</u>	<u>Y</u>	or N	
1. Custody Seals Present:	3. COC Present:	<b>☑</b> □ 1. Sa	mple labels present on bo	ottles:	$\checkmark$		
2. Custody Seals Intact:   ✓ 4.	. Smpl Dates/Time OK	<b>☑</b> 2. Co	ntainer labeling complete	:	$\checkmark$		
Cooler Temperature Y or N	<u>L</u>	3. Sa	mple container label / CC	C agree:	$\checkmark$		
1. Temp criteria achieved: ✓		Sam	ple Integrity - Condition	on	Y	or N	
Cooler temp verification: Infared G	Gun	· · · · · · · · · · · · · · · · · · ·	mple recvd within HT:	_	<b>✓</b>		
3. Cooler media: Ice (bag	g)		containers accounted for	:	<b>~</b>		
Quality Control Preservation Y or I	N N/A W		endition of sample:			ntact	
1. Trip Blank present / cooler:		✓ □ Sam	ple Integrity - Instruct	ions	Υ	or N	N/A
2. Trip Blank listed on COC:			nalysis requested is clear		<u> </u>		
3. Samples preserved properly: ✓ □			ottles received for unspec			✓	
4. VOCs headspace free: ✓		3. S	ufficient volume recvd for	analysis:	<b>✓</b>		
		4. C	ompositing instructions cl	ear:			<b>V</b>
		5. F	Itering instructions clear:				<b>✓</b>
Comments -Received trip blank not listed on 0	COC.						

TC20890: Chain of Custody

Page 1 of 3

Page 2 of 4







#### **Problem Resolution**

Accutest Job Number: TC20890

**CSR**: Elessa Sommers Response Date: 12/5/2012

Response: Trip blank is on separate report.

__

TC20890: Chain of Custody

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#### Sample Receipt Log

 Job #:
 TC20890
 Date / Time Received:
 12/4/2012 9:22:00 AM
 Initials:
 CH

Client: EARTHCON CONSULTANTS

Cooler #	Sample ID:	Vol	Bot #	Location	Pres	рН	Therm ID	Initial Temp	Therm CF	Corrected Temp
1	TC20890-1	40ml	1	VR	HCL	Note #1 - Preservative to be checked by analyst at the instrument.	IR6	2.2	0.2	2.4
1	TC20890-1	40ml	2	VR	HCL	Note #1 - Preservative to be checked by analyst at the instrument.	IR6	2.2	0.2	2.4
1	TC20890-1	40ml	3	VR	HCL	Note #1 - Preservative to be checked by analyst at the instrument.	IR6	2.2	0.2	2.4
1	TC20890-1	40ml	4	VR	HCL	Note #1 - Preservative to be checked by analyst at the instrument.	IR6	2.2	0.2	2.4
1	TC20890-1	40ml	5	VR	HCL	Note #1 - Preservative to be checked by analyst at the instrument.	IR6	2.2	0.2	2.4
1	TC20890-1	40ml	6	VR	HCL	Note #1 - Preservative to be checked by analyst at the instrument.	IR6	2.2	0.2	2.4
1	TC20890-1	40ml	7	VR	HCL	Note #1 - Preservative to be checked by analyst at the instrument.	IR6	2.2	0.2	2.4
1	TC20890-1	40ml	8	VR	HCL	Note #1 - Preservative to be checked by analyst at the instrument.	IR6	2.2	0.2	2.4
1	TC20890-1	40ml	9	VR	HCL	Note #1 - Preservative to be checked by analyst at the instrument.	IR6	2.2	0.2	2.4
1	TC20890-1	40ml	10	VR	HCL	Note #1 - Preservative to be checked by analyst at the instrument.	IR6	2.2	0.2	2.4
1	TC20890-1	40ml	11	VR	HCL	Note #1 - Preservative to be checked by analyst at the instrument.	IR6	2.2	0.2	2.4
1	TC20890-1	40ml	12	VR	HCL	Note #1 - Preservative to be checked by analyst at the instrument.	IR6	2.2	0.2	2.4
1	TC20890-1	40ml	13	VR	HCL	Note #1 - Preservative to be checked by analyst at the instrument.	IR6	2.2	0.2	2.4
1	TC20890-1	40ml	14	VR	HCL	Note #1 - Preservative to be checked by analyst at the instrument.	IR6	2.2	0.2	2.4
1	TC20890-1	40ml	15	VR	HCL	Note #1 - Preservative to be checked by analyst at the instrument.	IR6	2.2	0.2	2.4
1	TC20890-1	40ml	16	VR	HCL	Note #1 - Preservative to be checked by analyst at the instrument.	IR6	2.2	0.2	2.4
1	TC20890-1	40ml	17	VR	HCL	Note #1 - Preservative to be checked by analyst at the instrument.	IR6	2.2	0.2	2.4
1	TC20890-1	40ml	18	VR	HCL	Note #1 - Preservative to be checked by analyst at the instrument.	IR6	2.2	0.2	2.4

TC20890: Chain of Custody

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#### Appendix A **Laboratory Data Package Cover Page**

This signature page, the laboratory review checklist, and the following reportable data:

TC20890 This data package consists of

[]

QA Manager Name (Printed)

Richard Rodriguez

is true.

Signature

	R1	Field chain-of-custody documentation	n;
·	R2	Sample identification cross-reference	2;
	R3	Test reports (analytical data sheets) f	for each environmental sample that includes:
		a)	Items consistent with NELAC 5.13 or ISO/IEC 17025 Section 5.10
		b)	dilution factors,
		c)	preparation methods,
		d)	cleanup methods, and
		e)	if required for the project, tentatively identified compounds (TICs).
	R4	Surrogate recovery data including:	
		a)	Calculated recovery (%R), and
		b)	The laboratory's surrogate QC limits.
₽	R5	Test reports/summary forms for blank	k samples;
₽	R6	Test reports/summary forms for labor	ratory control samples (LCSs) including:
		a)	LCS spiking amounts,
		b)	Calculated %R for each analyte, and
		c)	The laboratory's LCS QC limits.
	R7	Test reports for project matrix spike/n	natrix spike duplicates (MS/MSDs) including:
		a)	Samples associated with the MS/MSD clearly identified,
		b)	MS/MSD spiking amounts,
		c)	Concentration of each MS/MSD analyte measured in the parent and
		d)	Calculated %Rs and relative percent differences (RPDs), and
		e)	The laboratory's MS/MSD QC limits
	R8	Laboratory analytical duplicate (if app	olicable) recovery and precision:
		a)	The amount of analyte measured in the duplicate,
		b)	The calculated RPD, and
		c)	The laboratory's QC limits for analytical duplicates.
	R9	List of method quantitation limits (MC	QLs) and detectability check sample results for each analyte for each
₽	R10	Other problems or anomalies.	
The Excep	tion Report	for each "No" or "Not Reviewed (NR)"	item in Laboratory Review Checklist and for each analyte, matrix, and
method for	r which the I	aboratory does not hold NELAC accre	editation under the Texas Laboratory Accreditation Program.
Release S	Statement:	I am responsible for the release of this	s laboratory data package. This laboratory is NELAC accredited under the
Texas Lab	oratory Acc	reditation Program for all the methods	, analytes, and matrices reported in this data package except as noted in
the Except	tion Report.	This data package has been reviewed	by the laboratory and is complete and technically compliant with the
requireme	nts of the m	ethods used, except where noted by the	he laboratory in the attached exception reports. By my signature below, I
affirm to th	e best of my	y knowledge, all problems/anomalies,	observed by the laboratory as having the potential to affect the quality of
the data, h	ave been id	lentified by the laboratory in the Labora	atory Review Checklist, and no information or data have been knowingly
withheld.			
Check, if	applicable:	This laboratory meets an exception u	inder 30 TAC&25.6 and was last inspection by
[]		[X]TCEQ or [] on April 20	011. Any findings affecting the data in this laboratory data package are
			n. The official signing the cover page of the report in which these data are
		·	data package and is by signature affirming the above release statement

Official Title (printed)

Laboratory Director

Date

12/12/2012



		ABORATORY REVIEW C						
Laboratory	/ Name:	Accutest Gulf Coast	LRC Date:	12/	12/2	012		
D:4 N-		Quarterly Well Sampling, Parker	Laborator Desirat North an		2000			
Project Na Reviewer		County, Texas Anita Patel	Laboratory Project Number: Prep Batch Number(s):	_	2089		70	
#1	A ²	DESCRIPTION	Prep Batch Number(s).	GSS				ER#5
 R1	OI	CHAIN-OF-CUSTODY (C-O-C):		IES	INO	INA	INIX	ER#
IX I	- 01		andard conditions of sample acceptability		ı		ı	
		upon receipt?	andara conditions of sample acceptability	X				
			anditions described in an exception report?	X				
R2	OI	Sample and quality control (QC) ide		T A				
	<del></del>	Are all field sample ID numbers cross	X	Π		ı		
		Are all laboratory ID numbers cross-re	T X					
R3	OI	Test reports	elerenced to the corresponding QC data:	+^				
КЭ	OI .	Were samples prepared and analyze	d within holding times?	X	1		1	
			all other raw values bracketed by calibration					
		standards?	X					
		Were calculations checked by a peer	X					
		Were all analyte identifications check	T X					
		Were sample detection limits reported		X				
			samples reported on a dry weight basis?	† ^`		Х		
		Were % moisture (or solids) reported			X			
		Were bulk soils/solids samples for vo						
	SW846 Method 5035?			Х				
		If required for the project, are TIC's re			Х			
R4	0	Surrogate recovery data						
		Were surrogates added prior to extra		Х				
		0 .	all samples within the laboratory QC limits?	Х				
R5 OI	Test reports/summary forms for bl							
		Were appropriate type(s) of blanks ar	•	X				
		Were blanks analyzed at the appropri	X					
		Were method blanks taken through the	l x					
		preparation and, if applicable, cleanu						
		Were blank concentrations <mql?< td=""><td></td><td>X</td><td></td><td></td><td></td><td></td></mql?<>		X				
R6	OI	Laboratory control samples (LCS):						
		Were all COCs included in the LCS?		X				
		_	ire analytical procedure, including prep and	Х				
		cleanup steps? Were LCSs analyzed at required freq	uonav2	X				
		Were LCS analyzed at required freq Were LCS (and LCSD, if applicable)		<del>  ^</del>				
			data document the laboratory's capability to	+^				-
		detect the COCs at the MDL used to		Х				5
		Was the LCSD RPD within QC limits				Х		
R7	OI	Matrix spike (MS) and matrix spike						
107		Were the project/method specified an		Х	1			
		Were MS/MSD analyzed at the appro		X				
		Were MS (and MSD, if applicable) %		1	Х			4
		Were the MS/MSD RPDs within labor		X				
R8	OI	Analytical duplicate data	•					
		Were appropriate analytical duplicate	s analyzed for each matrix?	Х	Π			
		Were analytical duplicates analyzed a	· · · · · · · · · · · · · · · · · · ·	X				
			ations within the laboratory QC limits?		Х			4
R9	OI	Method quantitation limits (MQLs):	·					
			te included in the laboratory data package?	Х				
			entration of the lowest non-zero calibration	Х				
			uded in the laboratory data package?		Х			2
R10	OI	Other problems/anomalies						
			ecial conditions noted in this LRC and ER?	Х				
			logy used to lower the SDL to minimize the	Х				
		Is the laboratory NELAC-accredited u	nder the Texas Laboratory Accreditation					
		Program for the analytes, matrices, ar	nd methods associated with this laboratory	Х				3



Laboratory	Name:	Accutest Gulf Coast	12/12/2012					
Project Na		Quarterly Well Sampling, Parker	Laboratory Project Number:	TC20890				
Reviewer		Anita Patel	Prep Batch Number(s):		32, VK5	79		
#1	A ²	DESCRIPTION	i top Baton Hamber(e).			NR ⁴ ER # ⁵		
S1	OI	Initial calibration (ICAL)	1201	10 1111				
	<u> </u>	Were response factors and/or relative		Т				
		limits?	response factors for each analyte main Qu	X				
		Were percent RSDs or correlation co	efficient criteria met?	X				
			mended in the method used for all analytes?	X				
			e lowest and highest standard used to			1 1		
		calculate the curve?		X				
		Are ICAL data available for all instrum	nents used?	l x l				
		Has the initial calibration curve been	verified using an appropriate second source					
		standard?	9	X				
S2	OI		erification (ICCV AND CCV) and continuing					
		Was the CCV analyzed at the method		Х				
			alyte within the method-required QC limits?	X		1 1		
		Was the ICAL curve verified for each	·	X				
		Was the absolute value of the analyte		X				
S3	0	Mass spectral tuning						
		Was the appropriate compound for th	e method used for tuning?	Х	$\overline{}$			
		Were ion abundance data within the		X		1 1		
S4	0		Internal standards (IS)					
		Were IS area counts and retention tin	Х	$\overline{}$				
S5 OI		Raw data (NELAC Section 5.5.10)		_				
	<u> </u>		matograms, spectral data) reviewed by an		$\overline{}$	П		
		analyst?	mategrame, opeonal data/ reviewed by air	X				
		Were data associated with manual in	tegrations flagged on the raw data?	X				
S6	0	O Dual column confirmation						
	Ť	Did dual column confirmation results	meet the method-required QC?		ΙX			
		Tentatively identified compounds (	<u>'</u>		-			
			s spectra and TIC data subject to appropriate	Т	Т			
		checks?			X			
S8	ı	Interference Check Sample (ICS) re						
		Were percent recoveries within metho			Ιx			
S9	ı		kes, and method of standard additions					
		Were percent differences, recoveries.		П				
		specified in the method?	, ,		Х			
S10	OI	Method detection limit (MDL) studi	es					
		Was a MDL study performed for each		ΧI		l l		
		Is the MDL either adjusted or support		X		5		
S11	OI	Proficiency test reports	, ,					
			ceptable on the applicable proficiency tests or	V				
		evaluation studies?	,	X				
S12	OI	Standards documentation						
		Are all standards used in the analyse	s NIST-traceable or obtained from other	V. I				
	appropriate source?	X						
S13			rocedures					
		Are the procedures for compound/analyte identification documented?		ΧI				
S14	OI	Demonstration of analyst compete	·					
		Was DOC conducted consistent with		Х				
		Is documentation of the analyst's com		X				
S15	OI		ion for methods (NELAC Chapter 5)					
	T -		the data documentated, verified, and	ι. Ι	T			
		validated, where applicable?		X				
S16	OI	Laboratory standard operating pro	cedures (SOPs)					
	T	Are laboratory SOPs current and on f		Х				
		, ,						



	LABOR	RATORY REVIEW CHEC	KLIST (continued): Exception	n Reports						
Laboratory	Name:	Accutest Gulf Coast	LRC Date:	12/12/2012						
Project Na	me:	Quarterly Well Sampling, Parker	Laboratory Project Number:	TC20890						
Reviewer	Name:	Anita Patel	Prep Batch Number(s):	GSS232, VK579						
ER# ¹	Description	n								
	For reporting	ng purposes, the MQL is defined in the	e report as the RL. The unadjusted MQL/RL is	reported in the method						
1	blank. The	SDL is defined in the report as the MI	DL.							
	For reporting purposes, the method blank represents the unadjusted MQL. The DCS is on file in the laboratory and is not									
2	included in	the laboratory data package.								
	The labora	tory is NELAC-accredited under the T	exas Laboratory Accreditation Program for the	analytes, matrices, and						
3	methods as	ssociated with this laboratory data pac	kage for analytes that are listed in the Texas F	ields of Accreditation.						
4	All anomali	es are discussed in the case narrative	<b>9.</b>							
	The labora	tory does not perform DCS analysis for	or Method RSKSOP-147/175. The component	s reported are not listed or						
5	do not have	e values in the Texas TRRP PCL table	es.							

1ER# = Exception Report identification number (an Exception Report should be completed for an item if "NR" or "No" is checked on





#### GC/MS Volatiles

QC Data Summaries

Includes the following where applicable:

- Method Blank Summaries
- Blank Spike Summaries
- Matrix Spike and Duplicate Summaries



**Method:** SW846 8260B

# Method Blank Summary Job Number: TC20890

Job Number:

PESTXST EarthCon Consultants Account:

**Project:** Quarterly Well Sampling, Parker County, Texas

Sample	File ID	DF	Analyzed	Ву	Prep Date	Prep Batch	Analytical Batch
VK579-MB	K13204.D	1	12/07/12	EM	n/a	n/a	VK579

#### The QC reported here applies to the following samples:

TC20890-1

CAS No.	Compound	Result	RL	MDL	Units Q
71-43-2	Benzene	ND	1.0	0.34	ug/l
100-41-4	Ethylbenzene	ND	1.0	0.32	ug/l
108-88-3	Toluene	ND	1.0	0.33	ug/l
1330-20-7	Xylene (total)	ND	3.0	0.87	ug/l

CAS No.	Surrogate Recoveries		Limits
1868-53-7	Dibromofluoromethane	110%	72-122%
17060-07-0	1,2-Dichloroethane-D4	107%	68-124%
2037-26-5	Toluene-D8	106%	80-119%
460-00-4	4-Bromofluorobenzene	100%	72-126%



**Method:** SW846 8260B

## Blank Spike Summary Job Number: TC20890

PESTXST EarthCon Consultants Account:

Quarterly Well Sampling, Parker County, Texas **Project:** 

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
VK579-BS	K13202.D	1	12/07/12	EM	n/a	n/a	VK579

The QC reported here applies to the following samples:

TC20890-1

CAS No.	Compound	Spike ug/l	BSP ug/l	BSP %	Limits
71-43-2	Benzene	25	23.8	95	68-119
100-41-4	Ethylbenzene	25	24.0	96	71-117
108-88-3	Toluene	25	24.1	96	73-119
1330-20-7	Xylene (total)	75	74.5	99	74-119

CAS No.	<b>Surrogate Recoveries</b>	BSP	Limits
17060-07-0	Dibromofluoromethane 1,2-Dichloroethane-D4 Toluene-D8	107% 105% 105%	72-122% 68-124% 80-119%
460-00-4	4-Bromofluorobenzene	100%	72-126%



^{* =} Outside of Control Limits.

## 6.3.1

Page 1 of 1

**Method:** SW846 8260B

## Matrix Spike/Matrix Spike Duplicate Summary

Job Number: TC20890

**Account:** PESTXST EarthCon Consultants

**Project:** Quarterly Well Sampling, Parker County, Texas

Sample TC20890-1MS TC20890-1MSD TC20890-1	<b>File ID</b> K13206.D K13207.D K13205.D	<b>DF</b> 1 1 1	Analyzed 12/07/12 12/07/12 12/07/12	By EM EM EM	Prep Date n/a n/a n/a	Prep Batch n/a n/a n/a	Analytical Batch VK579 VK579 VK579

The QC reported here applies to the following samples:

TC20890-1

CAS No.	Compound	TC2089 ug/l	00-1 Q	Spike ug/l	MS ug/l	MS %	MSD ug/l	MSD %	RPD	Limits Rec/RPD
71-43-2	Benzene	0.70	J	25	24.7	96	24.2	94	2	68-119/12
100-41-4	Ethylbenzene	1.0 U		25	23.0	92	22.7	91	1	71-117/12
108-88-3	Toluene	1.0 U		25	23.2	93	22.6	90	3	73-119/13
1330-20-7	Xylene (total)	3.0 U		75	71.5	95	71.1	95	1	74-119/13

CAS No.	<b>Surrogate Recoveries</b>	MS	MSD	TC20890-1	Limits
1868-53-7	Dibromofluoromethane	111%	110%	109%	72-122%
17060-07-0	1,2-Dichloroethane-D4	110%	110%	111%	68-124%
2037-26-5	Toluene-D8	105%	106%	105%	80-119%
460-00-4	4-Bromofluorobenzene	103%	102%	102%	72-126%



^{* =} Outside of Control Limits.



# GC Volatiles

# QC Data Summaries

### Includes the following where applicable:

- Method Blank Summaries
- Blank Spike Summaries
- Matrix Spike and Duplicate Summaries



Method: RSKSOP-147/175

# Method Blank Summary Job Number: TC20890

PESTXST EarthCon Consultants **Account:** 

**Project:** Quarterly Well Sampling, Parker County, Texas

Sample GSS232-MB	File ID SS005026.D	<b>DF</b> 1	<b>Analyzed</b> 12/06/12	By LT	Prep Date n/a	Prep Batch n/a	Analytical Batch GSS232

The QC reported here applies to the following samples:

TC20890-1

CAS No.	Compound	Result	RL	MDL	Units Q
74-82-8	Methane	ND	0.50	0.30	ug/l
74-85-1	Ethene	ND	1.0	0.50	ug/l
74-84-0	Ethane	ND	1.0	0.50	ug/l
74-98-6	Propane	ND	1.5	0.75	ug/l
75-28-5	Isobutane	ND	1.5	0.75	ug/l
106-97-8	Butane	ND	1.5	0.75	ug/l



Method: RSKSOP-147/175

# Blank Spike Summary Job Number: TC20890

Account: PESTXST EarthCon Consultants

Quarterly Well Sampling, Parker County, Texas **Project:** 

Sample GSS232-BS	File ID SS005023.D	<b>DF</b> 1	<b>Analyzed</b> 12/06/12	By LT	Prep Date n/a	Prep Batch n/a	Analytical Batch GSS232

The QC reported here applies to the following samples:

TC20890-1

CAS No.	Compound		Spike ug/l	BSP ug/l	BSP %	Limits
74-82-8	Methane	2	21.5	21.0	98	68-139
74-85-1	Ethene	4	57.4	54.7	95	52-145
74-84-0	Ethane	4	43.3	56.7	131	68-131
74-98-6	Propane	(	60.6	68.2	113	69-131
75-28-5	Isobutane	7	72.5	77.3	107	72-131
106-97-8	Butane	<b>2</b>	76.6	82.4	108	66-128



^{* =} Outside of Control Limits.

Method: RSKSOP-147/175

# **Matrix Spike Summary**

Job Number: TC20890

PESTXST EarthCon Consultants Account:

Quarterly Well Sampling, Parker County, Texas Project:

Sample TC20890-1MS TC20890-1 TC20890-1	File ID SS005029.D SS005027.D SS005030.D	1	Analyzed 12/06/12 12/06/12 12/06/12	By LT LT LT	Prep Date n/a n/a n/a	Prep Batch n/a n/a n/a	Analytical Batch GSS232 GSS232 GSS232
TC20890-1	SS005030.D	250	12/06/12	LT	n/a	n/a	GSS232

The QC reported here applies to the following samples:

TC20890-1

CAS No.	Compound	TC20890-1 ug/l Q	Spike ug/l	MS ug/l	MS %	Limits
74-82-8	Methane	20100 b	21.5	17100	-13815	* <del>6</del> 8-139
74-85-1	Ethene	1.0 U	57.4	5540	9654*	52-145
74-84-0	Ethane	3500 b	43.3	4120	1431*	a 68-131
74-98-6	Propane	66.8	60.6	172	174*	69-131
75-28-5	Isobutane	8.41	72.5	93.3	117	72-131
106-97-8	Butane	10.3	76.6	101	119	66-128

⁽a) Outside control limits due to high level in sample relative to spike amount.



⁽b) Result is from Run #2.

^{* =} Outside of Control Limits.

Method: RSKSOP-147/175

# **Duplicate Summary Job Number:** TC20890

PESTXST EarthCon Consultants Account:

**Project:** Quarterly Well Sampling, Parker County, Texas

Sample	File ID	DF	Analyzed	Ву	Prep Date	Prep Batch	Analytical Batch
TC20890-1DUP	SS005028.D	1	12/06/12	LT	n/a	n/a	GSS232
TC20890-1	SS005027.D	1	12/06/12	LT	n/a	n/a	GSS232
TC20890-1	SS005030.D	250	12/06/12	LT	n/a	n/a	GSS232

The QC reported here applies to the following samples:

TC20890-1

CAS No.	Compound	TC20890-1 ug/l Q	DUP ug/l	Q	RPD	Limits
74-82-8	Methane	20100 a	16400	E	21	53
74-85-1	Ethene	1.0 U	ND		nc	27
74-84-0	Ethane	3500 a	4020	E	14	43
74-98-6	Propane	66.8	99.1		39*	21
75-28-5	Isobutane	8.41	12.1		36*	35
106-97-8	Butane	10.3	15.1		38*	33

(a) Result is from Run #2.



^{* =} Outside of Control Limits.



### ANALYSIS REPORT

Lab #: 321077 Job #: 20030

Sample Name/Number: WW2-Pur-113012
Company: Oil Tracers, LLC
Date Sampled: 11/30/2012

Container: Dissolved Gas Bottle

Field/Site Name: Third Quarter Well Sampling

Location: Parker County, Texas

Formation/Depth:

Sampling Point:

Date Received: 12/05/2012 Date Reported: 2/01/2013

Component	Chemical	$\delta^{13}C$	δD	$\delta^{18} O$
Component	mol. %	%。	‰	%。
Carbon Monoxide	nd			
Hydrogen Sulfide	na			
Helium	na			
Hydrogen	nd			
Argon	0.217			
Oxygen	0.022			
Nitrogen	10.71			
Carbon Dioxide	0.082			
Methane	83.08	-50.48	-196.8	
Ethane	5.72	-32.80		
Ethylene	nd			
Propane	0.124	-28.1		
Propylene	nd			
Iso-butane	0.0153			
N-butane	0.0169			
Iso-pentane	0.0041			
N-pentane	0.0026			
Hexanes +	0.0052			

#### Remarks:

Analysis is of gas extracted from water by headspace equilibration. Analysis has been corrected for helium added to create headspace. Helium dilution factor = 0.34

nd = not detected. na = not analyzed. Isotopic composition of hydrogen is relative to VSMOW. Isotopic composition of carbon is relative to VPDB. Isotopic composition of oxygen is relative to VSMOW, except for carbon dioxide which is relative to VPDB. Calculations for BTU and specific gravity per ASTM D3588. Chemical compositions are normalized to 100%. Mol. % is approximately equal to vol. %.

^{*}Addition of helium negates the ability to detect native helium and may negate the ability to detect hydrogen.

^{**} Propane isotopes obtained online via GC-C-IRMS



12/12/12



### Technical Report for

EarthCon Consultants

Quarterly Well Sampling, Parker County, Texas

3rd Quarter / WW-22-Sim

Accutest Job Number: TC20876

Sampling Date: 12/01/12

### Report to:

EarthCon Consultants 4800 Sugar Grove Suite 420 Stafford, TX 77477

gfloreslovo@earthcon.com; djackson@jacksonsjoberg.com; mcpatton@rangeresources.com; escott@earthcon.com

ATTN: Gabriela Floreslovo

Total number of pages in report: 26



Test results contained within this data package meet the requirements of the National Environmental Laboratory Accreditation Conference and/or state specific certification programs as applicable.

Client Service contact: Elessa Sommers 713-271-4700

Certifications: TX (T104704220-12-8) AR (11-028-0) AZ (AZ0769) FL (E87628) KS (E-10366) LA (85695/04004) OK (211-035)

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Laboratory Director

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# **Sample Summary**

EarthCon Consultants

Job No:

TC20876

Quarterly Well Sampling, Parker County, Texas Project No: 3rd Quarter / WW-22-Sim

Sample Number	Collected Date		Received	Matrix Received Code Type		Client Sample ID	
rumber	Dute	Time By	Received	Couc	Турс	Sumple 12	
TC20876-1	12/01/12	13:00	12/04/12	AQ	Ground Water	WW-22-SIM-120112	





#### SAMPLE DELIVERY GROUP CASE NARRATIVE

Client: EarthCon Consultants Job No TC20876

Site: Quarterly Well Sampling, Parker County, Texas Report Date 12/12/2012 12:13:28 P

1 Sample was collected on 12/01/2012 and received intact at Accutest on 12/04/2012 and properly preserved in 1 cooler at 2.4 Deg C. The sample received an Accutest job number of TC20876. A listing of the Laboratory Sample ID, Client Sample ID and date of collection are presented in the Results Summary Section of this report.

Except as noted below, all method specified calibrations and quality control performance criteria were met for this job. For more information, please refer to QC summary pages.

#### Volatiles by GCMS By Method SW846 8260B

Matrix AQ Batch ID: VX1673

- All samples were analyzed within the recommended method holding time.
- All method blanks for this batch meet method specific criteria.
- Sample(s) TC20864-1MS, TC20864-1MSD were used as the QC samples indicated.

#### Volatiles by GC By Method RSKSOP-147/175

Matrix AQ Batch ID: GSS232

- All samples were analyzed within the recommended method holding time.
- All method blanks for this batch meet method specific criteria.
- Sample(s) TC20890-1DUP, TC20890-1MS were used as the QC samples indicated.
- Matrix Spike Recovery(s) for Ethene, Propane are outside control limits. Probable cause due to matrix interference.
- Matrix Spike Recovery(s) for Ethane, Methane are outside control limits. Outside control limits due to high level in sample relative to spike amount.
- RPD(s) for Duplicate for Butane, Isobutane, Propane are outside control limits for sample TC20890-1DUP.

Accutest Laboratories Gulf Coast (ALGC) certifies that this report meets the project requirements for analytical data produced for the samples as received at ALGC and as stated on the COC. ALGC certifies that the data meets the Data QualityObjectives for precision, accuracy and completeness as specified in the ALGC Quality Manual except as noted above. This report is to be used in its entirety. ALGC is not responsible for any assumptions of data quality if partial data packages are used



# **Summary of Hits Job Number:** TC20876

Account: EarthCon Consultants

Quarterly Well Sampling, Parker County, Texas 12/01/12**Project:** 

**Collected:** 

Lab Sample ID Analyte	Client Sample ID	Result/ Qual	MQL	SDL	Units	Method
TC20876-1	WW-22-SIM-1201	12				
Methane Ethane		4.19 0.192	0.025 0.0010	0.015 0.00050	mg/l mg/l	RSKSOP-147/175 RSKSOP-147/175



Sample Results  Report of Analysis	
Report of Analysis	



### 4

# **Report of Analysis**

Client Sample ID: WW-22-SIM-120112

 Lab Sample ID:
 TC20876-1
 Date Sampled:
 12/01/12

 Matrix:
 AQ - Ground Water
 Date Received:
 12/04/12

 Method:
 SW846 8260B
 Percent Solids:
 n/a

**Project:** Quarterly Well Sampling, Parker County, Texas

	File ID	DF	Analyzed	By	<b>Prep Date</b>	Prep Batch	Analytical Batch
Run #1	X0087073.D	1	12/06/12	CF	n/a	n/a	VX1673
Run #2							

	Purge Volume	
Run #1	5.0 ml	
Run #2		

#### **Purgeable Aromatics**

CAS No.	Compound	Result	MQL	SDL	Units	Q
71-43-2 108-88-3 100-41-4 1330-20-7	Benzene Toluene Ethylbenzene Xylene (total)	0.00034 U 0.00033 U 0.00032 U 0.00087 U	0.0010 0.0010 0.0010 0.0030	0.00034 0.00033 0.00032 0.00087	mg/l mg/l mg/l mg/l	
CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits		
1868-53-7 17060-07-0 2037-26-5 460-00-4	Dibromofluoromethane 1,2-Dichloroethane-D4 Toluene-D8 4-Bromofluorobenzene	104% 96% 99% 97%		72-122% 68-124% 80-119% 72-126%		

 $\begin{array}{ll} U = & Not \; detected & SDL \; - \; Sample \; Detection \; Limit \\ MQL = & Method \; Quantitation \; Limit \\ \end{array}$ 

E = Indicates value exceeds calibration range

J = Indicates an estimated value

B = Indicates analyte found in associated method blank N = Indicates presumptive evidence of a compound



# **Report of Analysis**

Client Sample ID: WW-22-SIM-120112

 Lab Sample ID:
 TC20876-1
 Date Sampled:
 12/01/12

 Matrix:
 AQ - Ground Water
 Date Received:
 12/04/12

 Method:
 RSKSOP-147/175
 Percent Solids:
 n/a

**Project:** Quarterly Well Sampling, Parker County, Texas

	File ID	DF	Analyzed	Ву	Prep Date	Prep Batch	<b>Analytical Batch</b>
Run #1	SS005046.D	1	12/06/12	LT	n/a	n/a	GSS232
Run #2	SS005049.D	50	12/06/12	LT	n/a	n/a	GSS232

#### **RSK147 Special List**

CAS No.	Compound	Result	MQL	SDL	Units	Q
74-82-8	Methane	4.19 a	0.025	0.015	mg/l	
74-85-1	Ethene	0.00050 U	0.0010	0.00050	mg/l	
74-84-0	Ethane	0.192	0.0010	0.00050	mg/l	
74-98-6	Propane	0.00075 U	0.0015	0.00075	mg/l	
75-28-5	Isobutane	0.00075 U	0.0015	0.00075	mg/l	
106-97-8	Butane	0.00075 U	0.0015	0.00075	mg/l	

(a) Result is from Run# 2

U = Not detected

SDL - Sample Detection Limit

MQL = Method Quantitation Limit

E = Indicates value exceeds calibration range

J = Indicates an estimated value

B = Indicates analyte found in associated method blank N = Indicates presumptive evidence of a compound





Misc. Forms

Custody Documents and Other Forms

Includes the following where applicable:

- Chain of Custody
- LRC Form



### CHAIN OF CUSTODY

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	TEL. 713-2	71-4700 FAX: 713-271-4770 www.accutest.com	3	Accidest Quote #		100	D 7 W
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Client / Reporting Information Project Name:	Frojectin	IOI II DESCRIPTION	C. C. CALLES TO SERVICE STATE OF THE SERVICE STATE OF THE SERVICE STATE OF THE SERVICE STATE OF THE SERVICE STATE OF THE SERVICE STATE OF THE SERVICE STATE OF THE SERVICE STATE OF THE SERVICE STATE OF THE SERVICE STATE OF THE SERVICE STATE OF THE SERVICE STATE OF THE SERVICE STATE OF THE SERVICE STATE OF THE SERVICE STATE OF THE SERVICE STATE OF THE SERVICE STATE OF THE SERVICE STATE OF THE SERVICE STATE OF THE SERVICE STATE OF THE SERVICE STATE OF THE SERVICE STATE OF THE SERVICE STATE OF THE SERVICE STATE OF THE SERVICE STATE OF THE SERVICE STATE OF THE SERVICE STATE OF THE SERVICE STATE OF THE SERVICE STATE OF THE SERVICE STATE OF THE SERVICE STATE OF THE SERVICE STATE OF THE SERVICE STATE OF THE SERVICE STATE OF THE SERVICE STATE OF THE SERVICE STATE OF THE SERVICE STATE OF THE SERVICE STATE OF THE SERVICE STATE OF THE SERVICE STATE OF THE SERVICE STATE OF THE SERVICE STATE OF THE SERVICE STATE OF THE SERVICE STATE OF THE SERVICE STATE OF THE SERVICE STATE OF THE SERVICE STATE OF THE SERVICE STATE OF THE SERVICE STATE OF THE SERVICE STATE OF THE SERVICE STATE OF THE SERVICE STATE OF THE SERVICE STATE OF THE SERVICE STATE OF THE SERVICE STATE OF THE SERVICE STATE OF THE SERVICE STATE OF THE SERVICE STATE OF THE SERVICE STATE OF THE SERVICE STATE OF THE SERVICE STATE OF THE SERVICE STATE OF THE SERVICE STATE OF THE SERVICE STATE OF THE SERVICE STATE OF THE SERVICE STATE OF THE SERVICE STATE OF THE SERVICE STATE OF THE SERVICE STATE OF THE SERVICE STATE OF THE SERVICE STATE OF THE SERVICE STATE OF THE SERVICE STATE OF THE SERVICE STATE OF THE SERVICE STATE OF THE SERVICE STATE OF THE SERVICE STATE OF THE SERVICE STATE OF THE SERVICE STATE OF THE SERVICE STATE OF THE SERVICE STATE OF THE SERVICE STATE OF THE SERVICE STATE OF THE SERVICE STATE OF THE SERVICE STATE OF THE SERVICE STATE OF THE SERVICE STATE OF THE SERVICE STATE OF THE SERVICE STATE OF THE SERVICE STATE OF THE SERVICE STATE OF THE SERVICE STATE OF THE SERVICE STATE OF THE SERVICE STATE OF THE SERVICE STATE OF THE SERVICE STATE OF THE SERVICE STATE				
Company Name				oʻ	1 1 1		
EarthCon Consultants, Inc. Third Quarterly	Well Sampling, Parker Co	unty, Texas	The second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second secon	Ethene, Isobutane, Methane,			DW - Drinking Water
Street Address Street	iii.			Jet			GW - Ground Water WW - Water
4800 Sugar Grove Blvd., Suite 390		Billing Information ( if differen	nt from Report to)	6			SW - Surface Water
City State Zip City	State C	Company Name		ta			SO - Soil SL- Sludge
Stafford TX 77477				1월			SED-Sediment
Project Contact E-mail Project #	\$	Street Address		<u>×</u>			OI - Oil LIQ - Other Liquid
Gabriela Floreslovo				<u>  e</u>			AIR - Air
Phone # Fax # Client Purchase Ord	ler#	City	State Zip	175 th			SOL - Other Solid WP - Wipe
281-201-3513							FB-Field Blank
Sampler(s) Name(s) Phone # Project Manager	/	Attention:		m E &			
JB, SH, RM				를 불 회		1   1   1	
	Collection	N N	umber of preserved Bottles	g   e g			
		# of   E   S	HO3 H2SO4 NONE DI Wate MEOH TSP NaHSO4 ENCOR	BTEX 8260B Butane, Ethane, E Propane by RSK-			LAB USE ONLY
Accutest Sample # Field ID / Point of Collection Date	Time Sampled By	Matrix bottles E N N	HZSO NONE DI War MECH TSP NaHSI ENCO	m m m			LAB USE ONLY
1	300 JB	60 6 A		oc a			i
1 ww-22-5:m-120112 12/1/12/	300 10	GW 6 0	<del></del>				
					1		
				+-+-		<del></del>	
		7/3			1 1 1		
			<del></del>				
					1 1 1		
			<del></del>				
						+	
			<del>                                     </del>				
Tumaround Time ( Business days)			Deliverable Information		Con	mments / Special Instructions	
X Standard Approved By (Accute	st PM): / Date:	Commercial "A" (Le	· —				
5 Day RUSH		Commercial "B" ( Le		at			
4 Day RUSH		FULT1 (Level 3+4)	Other				
3 Day RUSH		REDT1 (Level 3+4)					
2 Day RUSH		Commercial "C"					
1 Day EMERGENCY			ercial "A" = Results Only ercial "B" = Results + QC Summa				
Emergency & Rush T/A data available VIA Lablink	<b>₽</b>	Commi	ercial "C" = Results + QC & Surro	gate Summary			
Emergency & Rush T/A data available V/A Labilink	ple Custody must be docum	nented below each time san	nples change possession, in	cluding courier deliv	very.		
Relinquishing by Sampler: Date Time;	Received By:		Relinquished By:		Date Time:	Received By:	
11. 1Bust 3/2/2/1619	1		2			2	
Relinquished by Sampler: Date Time:	Received By:	$\times$	Relinquished By:		Date Time:	Received By:	
3	3		Gustody Seal #	Intact Prese	rved where applicable	<u> </u>	Cooler Temp.
Relinquished by: Date Time:	Received By: 5			Not intact	Inved where applicable		

TC20876: Chain of Custody Page 1 of 4







### **Accutest Laboratories Sample Receipt Summary**

Accutest Job Number: TC20	0876	Client:	EARTHCON	CONS	SULTANT	S	Project:	3RD QTR WEL	L SAMPLI	NG,PARK	ER COUNTY,T
Date / Time Received: 12/4/	2012		Delivery Me	ethod:		Client	Airbill #'s:				
No. Coolers: 1	Therm ID:	IR6					Temp Adjus	tment Factor:	0.2		
Cooler Temps (Initial/Adjuste	ed): #1: (2.2	<u>/2.4)</u>									
Cooler Security Y	or N			Y or	· N_	Sample Integr	ity - Documer	ntation_	Υ	or N	
Custody Seals Present:  ✓		3. COC P		✓		1. Sample labels	s present on bo	ttles:	<b>~</b>		
2. Custody Seals Intact:	☐ 4.	Smpl Date	s/Time OK	✓		2. Container lab	eling complete:		<b>✓</b>		
Cooler Temperature	Y or N	<u>L</u>				3. Sample conta	ainer label / CO	C agree:	<b>✓</b>		
1. Temp criteria achieved:	<b>V</b>	]				Sample Integr	rity - Conditio	on	ΥΥ	or N	
Cooler temp verification:	Infared G	un				Sample recvo	d within HT:	_	<b>✓</b>		
Cooler media:	Ice (baç	3)				2. All containers	accounted for:		<b>~</b>		
<b>Quality Control Preservation</b>	Y or I	N N/A	<u>_v</u>	WTB	STB	3. Condition of s	sample:			Intact	
1. Trip Blank present / cooler:	<b>V</b>			<b>✓</b>		Sample Integr	rity - Instructi	ons	Υ	or N	N/A
2. Trip Blank listed on COC:						1. Analysis requ			<u> </u>		
3. Samples preserved properly:	<b>V</b>					2. Bottles recei		fied tests		✓	
4. VOCs headspace free:	<b>v</b>					3. Sufficient vol	lume recvd for a	analysis:	<b>✓</b>		
						4. Compositing	instructions cle	ar:			<b>✓</b>
						5. Filtering instr	ructions clear:				<b>~</b>
Comments - Received trip blan	k not listed on	COC.			-						

TC20876: Chain of Custody Page 2 of 4

Page 1 of 3







#### **Problem Resolution**

Accutest Job Number: TC20876

**CSR**: Elessa Sommers Response Date: 12/5/2012

Response: Trip blank is on separate report.

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TC20876: Chain of Custody Page 3 of 4







### Sample Receipt Log

 Job #:
 TC20876
 Date / Time Received:
 12/4/2012 9:22:00 AM
 Initials:
 CH

Client: EARTHCON CONSULTANTS

Cooler #	Sample ID:	Vol	Bot #	Location	Pres	рН	Therm ID	Initial Temp	Therm CF	Corrected Temp
1	TC20876-1	40ml	1	VR	HCL	Note #1 - Preservative to be checked by analyst at the instrument.	IR6	2.2	0.2	2.4
1	TC20876-1	40ml	2	VR	HCL	Note #1 - Preservative to be checked by analyst at the instrument.	IR6	2.2	0.2	2.4
1	TC20876-1	40ml	3	VR	HCL	Note #1 - Preservative to be checked by analyst at the instrument.	IR6	2.2	0.2	2.4
1	TC20876-1	40ml	4	VR	HCL	Note #1 - Preservative to be checked by analyst at the instrument.	IR6	2.2	0.2	2.4
1	TC20876-1	40ml	5	VR	HCL	Note #1 - Preservative to be checked by analyst at the instrument.	IR6	2.2	0.2	2.4
1	TC20876-1	40ml	6	VR	HCL	Note #1 - Preservative to be checked by analyst at the instrument	IR6	2.2	0.2	2.4

TC20876: Chain of Custody

Page 4 of 4



#### Laboratory Data Package Cover Page Appendix A

This signature page, the laboratory review checklist, and the following reportable data:

TC20876 This data package consists of

QA Manager Name (Printed)

Richard Rodriguez

Signature

ė	R1	Field chain-of-custody docume	entation;
	R2	Sample identification cross-ref	ference;
Ģ	R3	Test reports (analytical data sh	neets) for each environmental sample that includes:
		a)	Items consistent with NELAC 5.13 or ISO/IEC 17025 Section 5.10
		b)	dilution factors,
		c)	preparation methods,
		d)	cleanup methods, and
		e)	if required for the project, tentatively identified compounds (TICs).
	R4	Surrogate recovery data include	ding:
		a)	Calculated recovery (%R), and
		b)	The laboratory's surrogate QC limits.
	R5	Test reports/summary forms for	or blank samples;
	R6	Test reports/summary forms for	or laboratory control samples (LCSs) including:
		a)	LCS spiking amounts,
		b)	Calculated %R for each analyte, and
		c)	The laboratory's LCS QC limits.
	R7	Test reports for project matrix:	spike/matrix spike duplicates (MS/MSDs) including:
		a)	Samples associated with the MS/MSD clearly identified,
		b)	MS/MSD spiking amounts,
		c)	Concentration of each MS/MSD analyte measured in the parent and
		d)	Calculated %Rs and relative percent differences (RPDs), and
		e)	The laboratory's MS/MSD QC limits
	R8	Laboratory analytical duplicate	e (if applicable) recovery and precision:
		a)	The amount of analyte measured in the duplicate,
		b)	The calculated RPD, and
		c)	The laboratory's QC limits for analytical duplicates.
Ģ	R9		its (MQLs) and detectability check sample results for each analyte for each
Ģ	R10	Other problems or anomalies.	
			d (NR)" item in Laboratory Review Checklist and for each analyte, matrix, and
method fo	or which the	laboratory does not hold NELAC	Caccreditation under the Texas Laboratory Accreditation Program.
Release	Statement:	I am responsible for the release	e of this laboratory data package. This laboratory is NELAC accredited under the
Texas Lal	ooratory Acc	creditation Program for all the me	ethods, analytes, and matrices reported in this data package except as noted in
the Excep	tion Report	. This data package has been re	eviewed by the laboratory and is complete and technically compliant with the
requireme	ents of the m	nethods used, except where note	ed by the laboratory in the attached exception reports. By my signature below, I
affirm to the	ne best of m	ny knowledge, all problems/anon	nalies, observed by the laboratory as having the potential to affect the quality of
the data, I	nave been i	dentified by the laboratory in the	Laboratory Review Checklist, and no information or data have been knowingly
withheld.			
	applicable	•	ption under 30 TAC&25.6 and was last inspection by
[]			April 2011. Any findings affecting the data in this laboratory data package are
			s herein. The official signing the cover page of the report in which these data are
		used is responsible for releasing	ng this data package and is by signature affirming the above release statement

Official Title (printed)

Laboratory Director

Date 12/12/2012



			HECKLIST: REPORTABLE					
Laboratory	/ Name:		LRC Date:	12	/12/2	012		
		Quarterly Well Sampling, Parker						
Project Na	me:	County, Texas	Laboratory Project Number:	TC	2087	76		
Reviewer	Name:	Anita Patel	Prep Batch Number(s):	GSS	232,	VX16	73	
# ¹	A ²	DESCRIPTION		YES	NO	NA ³	NR⁴	ER#
R1	OI	CHAIN-OF-CUSTODY (C-O-C):						
		Did samples meet the laboratory's star	ndard conditions of sample acceptability	l x				
		upon receipt?						
		Were all departures from standard cor	nditions described in an exception report?	X				
R2	OI	Sample and quality control (QC) ide	entification					
		Are all field sample ID numbers cross-	referenced to the laboratory ID numbers?	Х				
		Are all laboratory ID numbers cross-re	ferenced to the corresponding QC data?	Х				
R3	OI	Test reports						
		Were samples prepared and analyzed	Х					
		Other than those results <mql, a<="" td="" were=""><td></td><td></td><td></td><td></td><td></td></mql,>						
		standards?	X					
		Were calculations checked by a peer	X					
		Were all analyte identifications checke	Х					
		Were sample detection limits reported	Х					
		Were all results for soil and sediment			Х			
		Were % moisture (or solids) reported f				Х		
		Were bulk soils/solids samples for vol-	atile analysis extracted with methanol per			Х		
		SW846 Method 5035?				^		
		If required for the project, are TIC's rep	ported?			Χ		
R4	0	Surrogate recovery data						
		Were surrogates added prior to extrac		X				
			all samples within the laboratory QC limits?	X				
R5	OI	Test reports/summary forms for bla	<u> </u>					
		Were appropriate type(s) of blanks and		X				
		Were blanks analyzed at the appropria		X				
		Were method blanks taken through the	l x					
		preparation and, if applicable, cleanup	^					
		Were blank concentrations <mql?< td=""><td>X</td><td></td><td></td><td></td><td></td></mql?<>	X					
R6	OI	Laboratory control samples (LCS):						
		Were all COCs included in the LCS?		X				
		_ ~	re analytical procedure, including prep and	l x				
		cleanup steps?						
		Were LCSs analyzed at required frequ		X				
		Were LCS (and LCSD, if applicable) %		X				
			data document the laboratory's capability to	X				5
		detect the COCs at the MDL used to c		<u> </u>				
		Was the LCSD RPD within QC limits?				Х		
R7	OI	Matrix spike (MS) and matrix spike						
		Were the project/method specified and		X	<u> </u>			<u> </u>
		Were MS/MSD analyzed at the approp		X				<u> </u>
		Were MS (and MSD, if applicable) %F			Х			4
		Were the MS/MSD RPDs within labora	atory QC limits?	X				
R8	OI	Analytical duplicate data						
		Were appropriate analytical duplicates		X				
		Were analytical duplicates analyzed a		X	L.			
		Were RPDs or relative standard devia	tions within the laboratory QC limits?		Х			4
R9	OI	Method quantitation limits (MQLs):						
			e included in the laboratory data package?	X				
		Do the MQLs correspond to the conce	X	L				
		Are unadjusted MQLs and DCSs inclu	uded in the laboratory data package?		Х			2
R10	OI	Other problems/anomalies						
			ecial conditions noted in this LRC and ER?	X				
			ogy used to lower the SDL to minimize the	X				
		,	nder the Texas Laboratory Accreditation		1	1		
			d methods associated with this laboratory	X	1	1		3
		data package?						



Laboratory Name:		Accutest Gulf Coast LRC Date:				12/12/2012			
Project Na	me:	Quarterly Well Sampling, Parker Laboratory Project Number:		TC	2087	<b>'</b> 6			
Reviewer	Name:	Anita Patel	Prep Batch Number(s):	GSS	232,	VX16	73		
#1	A ²	DESCRIPTION		YES	NO	NA ³	NR⁴	ER #5	
S1	OI	Initial calibration (ICAL)							
		· ·	e response factors for each analyte within QC	l _x l					
		limits?		X					
			Vere percent RSDs or correlation coefficient criteria met?						
			mended in the method used for all analytes?	Х					
			ne lowest and highest standard used to	x					
		calculate the curve?							
		Are ICAL data available for all instrum		Х					
			verified using an appropriate second source	X					
S2	OI	standard?	erification (ICCV AND CCV) and continuing						
32	<u> </u>	Was the CCV analyzed at the method		Х					
			alyte within the method-required QC limits?	X					
		Was the ICAL curve verified for each		X					
			e concentration in the inorganic CCB <mdl?< th=""><th></th><th></th><th>Х</th><th></th><th></th></mdl?<>			Х			
S3	0	Mass spectral tuning	o de località de la la la la la la la la la la la la la						
	_ <u> </u>	Was the appropriate compound for the	ne method used for tuning?	Х					
		Were ion abundance data within the		X					
S4	0	Internal standards (IS)							
			nes within the method-required QC limits?	Х					
S5	OI	Raw data (NELAC Section 5.5.10)							
		Were the raw data (for example, chro	Х						
		analyst?	^						
		Were data associated with manual in	Х						
S6	0	Dual column confirmation							
		Did dual column confirmation results			Χ				
S7	0	Tentatively identified compounds (							
			s spectra and TIC data subject to appropriate			Х			
		checks?			$\Box$	^			
S8	ı	Interference Check Sample (ICS) r				. V			
	<u> </u>	Were percent recoveries within metho				Х			
S9	I		kes, and method of standard additions						
		specified in the method?	, and the linearity within the QC limits			Χ			
S10	OI	Method detection limit (MDL) studi	os .						
310	- 01	Was a MDL study performed for each		Х					
		Is the MDL either adjusted or support		X				5	
S11	OI	Proficiency test reports	iou zy are unulyele el z e e e .					Ť	
			ceptable on the applicable proficiency tests or	\ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \					
		evaluation studies?		X					
S12	OI	Standards documentation							
		Are all standards used in the analyse	s NIST-traceable or obtained from other	х					
		appropriate source?		^					
S13	OI	Compound/analyte identification p							
		Are the procedures for compound/and	•	Х					
S14	OI	Demonstration of analyst compete							
		Was DOC conducted consistent with		Х	Ш				
		Is documentation of the analyst's com	<u> </u>	Х					
S15	OI		ion for methods (NELAC Chapter 5)						
		S .	the data documentated, verified, and	x					
		validated, where applicable?	anduras (CODs)						
S16	OI	Laboratory standard operating pro		Х					
<u> </u>	L	Are laboratory SOPs current and on file for each method performed?					$\Box$		



	LABUR	CATORT REVIEW CHEC	KLIST (continued): Exception	n keports						
Laboratory	Name:	Accutest Gulf Coast	LRC Date:	12/12/2012						
Project Na	me:	Quarterly Well Sampling, Parker	Laboratory Project Number:	TC20876						
Reviewer	Name:	Anita Patel	Prep Batch Number(s):	GSS232, VX1673						
ER# ¹	Description									
	For reporti	ng purposes, the MQL is defined in the	e report as the RL. The unadjusted MQL/RL is	reported in the method						
1		SDL is defined in the report as the MI								
	For reporting purposes, the method blank represents the unadjusted MQL. The DCS is on file in the laboratory and is not									
2	included in	the laboratory data package.								
	The laboratory is NELAC-accredited under the Texas Laboratory Accreditation Program for the analytes, matrices, and									
3	methods a	ssociated with this laboratory data pac	kage for analytes that are listed in the Texas F	ields of Accreditation.						
4	All anomal	ies are discussed in the case narrative	).							
	The labora	tory does not perform DCS analysis for	or Method RSKSOP-147/175. The component	s reported are not listed or						
5	do not hav	e values in the Texas TRRP PCL table	es.							
		<u> </u>								
		·	· · · · · · · · · · · · · · · · · · ·	<u> </u>						
		·								

¹ER# = Exception Report identification number (an Exception Report should be completed for an item if "NR" or "No" is checked on



# GC/MS Volatiles

QC Data Summaries

Includes the following where applicable:

- Method Blank Summaries
- Blank Spike Summaries
- Matrix Spike and Duplicate Summaries



**Method:** SW846 8260B

# Method Blank Summary Job Number: TC20876

Job Number:

PESTXST EarthCon Consultants **Account:** 

**Project:** Quarterly Well Sampling, Parker County, Texas

Sample VX1673-MB	<b>File ID</b> X0087062.D	<b>DF</b> 1	<b>Analyzed</b> 12/06/12	<b>By</b> CF	<b>Prep Date</b> n/a	Prep Batch n/a	Analytical Batch VX1673

The QC reported here applies to the following samples:

CAS No.	Compound	Result	RL	MDL	Units Q
71-43-2	Benzene	ND	1.0	0.34	ug/l
100-41-4	Ethylbenzene	ND	1.0	0.32	ug/l
108-88-3	Toluene	ND	1.0	0.33	ug/l
1330-20-7	Xylene (total)	ND	3.0	0.87	ug/l

CAS No. Surrogate Recoveries		Limits	
1868-53-7 Dibromofluoromethane	105%	72-122%	
17060-07-0 1,2-Dichloroethane-D4	95%	68-124%	
2037-26-5 Toluene-D8	99%	80-119%	
460-00-4 4-Bromofluorobenzene	98%	72-126%	



**Method:** SW846 8260B

# Blank Spike Summary Job Number: TC20876

PESTXST EarthCon Consultants Account:

Quarterly Well Sampling, Parker County, Texas **Project:** 

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	<b>Analytical Batch</b>
VX1673-BS	X0087060.D	1	12/06/12	CF	n/a	n/a	VX1673

The QC reported here applies to the following samples:

CAS No.	Compound	Spike ug/l	BSP ug/l	BSP %	Limits
71-43-2	Benzene	25	22.2	89	68-119
100-41-4	Ethylbenzene	25	22.1	88	71-117
108-88-3	Toluene	25	22.4	90	73-119
1330-20-7	Xylene (total)	75	67.7	90	74-119

CAS No.	<b>Surrogate Recoveries</b>	BSP	Limits
17060-07-0 2037-26-5	Dibromofluoromethane 1,2-Dichloroethane-D4 Toluene-D8	101% 99% 101%	72-122% 68-124% 80-119%
460-00-4	4-Bromofluorobenzene	92%	72-126%



^{* =} Outside of Control Limits.

# 6.3.1

Page 1 of 1

**Method:** SW846 8260B

#### σ

# Matrix Spike/Matrix Spike Duplicate Summary

Job Number: TC20876

**Account:** PESTXST EarthCon Consultants

**Project:** Quarterly Well Sampling, Parker County, Texas

Sample	File ID	DF	Analyzed	By	<b>Prep Date</b>	<b>Prep Batch</b>	<b>Analytical Batch</b>
TC20864-1MS	X0087064.D	1	12/06/12	CF	n/a	n/a	VX1673
TC20864-1MSD	X0087065.D	1	12/06/12	CF	n/a	n/a	VX1673
TC20864-1	X0087063.D	1	12/06/12	CF	n/a	n/a	VX1673

The QC reported here applies to the following samples:

CAS No.	Compound	TC20864-1 ug/l Q	Spike ug/l	MS ug/l	MS %	MSD ug/l	MSD %	RPD	Limits Rec/RPD
71-43-2	Benzene	1.0 U	25	23.0	92	22.4	90	3	68-119/12
100-41-4	Ethylbenzene	1.0 U	25	22.7	91	22.4	90	1	71-117/12
108-88-3	Toluene	1.0 U	25	22.9	92	22.5	90	2	73-119/13
1330-20-7	Xylene (total)	3.0 U	75	69.8	93	68.4	91	2	74-119/13

CAS No.	<b>Surrogate Recoveries</b>	MS MSD		TC20864-1	Limits	
1868-53-7	Dibromofluoromethane	103%	101%	105%	72-122%	
17060-07-0	1,2-Dichloroethane-D4	98%	98%	96%	68-124%	
2037-26-5	Toluene-D8	100%	100%	100%	80-119%	
460-00-4	4-Bromofluorobenzene	91%	92%	98%	72-126%	

^{* =} Outside of Control Limits.



# GC Volatiles

QC Data Summaries

Includes the following where applicable:

- Method Blank Summaries
- Blank Spike Summaries
- Matrix Spike and Duplicate Summaries



Method: RSKSOP-147/175

# Method Blank Summary Job Number: TC20876

Job Number:

PESTXST EarthCon Consultants **Account:** 

**Project:** Quarterly Well Sampling, Parker County, Texas

Sample GSS232-MB	File ID SS005026.D	<b>DF</b> 1	<b>Analyzed</b> 12/06/12	By LT	Prep Date n/a	Prep Batch	Analytical Batch GSS232

The QC reported here applies to the following samples:

CAS No.	Compound	Result	RL	MDL	Units Q
74-82-8	Methane	ND	0.50	0.30	ug/l
74-85-1	Ethene	ND	1.0	0.50	ug/l
74-84-0	Ethane	ND	1.0	0.50	ug/l
74-98-6	Propane	ND	1.5	0.75	ug/l
75-28-5	Isobutane	ND	1.5	0.75	ug/l
106-97-8	Butane	ND	1.5	0.75	ug/l



Method: RSKSOP-147/175

# Blank Spike Summary Job Number: TC20876

PESTXST EarthCon Consultants Account:

Quarterly Well Sampling, Parker County, Texas **Project:** 

Sample GSS232-BS	File ID SS005023.D	<b>DF</b> 1	<b>Analyzed</b> 12/06/12	By LT	Prep Date n/a	Prep Batch n/a	Analytical Batch GSS232

The QC reported here applies to the following samples:

CAS No.	Compound	Spike ug/l	BSP ug/l	BSP %	Limits
74-82-8	Methane	21.5	21.0	98	68-139
74-85-1	Ethene	57.4	54.7	95	52-145
74-84-0	Ethane	43.3	56.7	131	68-131
74-98-6	Propane	60.6	68.2	113	69-131
75-28-5	Isobutane	72.5	77.3	107	72-131
106-97-8	Butane	76.6	82.4	108	66-128



^{* =} Outside of Control Limits.

Method: RSKSOP-147/175

# **Matrix Spike Summary**

Job Number: TC20876

**Account:** PESTXST EarthCon Consultants

**Project:** Quarterly Well Sampling, Parker County, Texas

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
TC20890-1MS	SS005029.D	1	12/06/12	LT	n/a	n/a	GSS232
TC20890-1	SS005027.D	1	12/06/12	LT	n/a	n/a	GSS232
TC20890-1	SS005030.D	250	12/06/12	LT	n/a	n/a	GSS232

The QC reported here applies to the following samples:

CAS No.	Compound	TC20890-1 ug/l Q	Spike ug/l	MS ug/l	MS %	Limits
74-82-8	Methane	20100 b	21.5	17100	-13815	* <del>0</del> 8-139
74-85-1	Ethene	1.0 U	57.4	5540	9654*	52-145
74-84-0	Ethane	3500 b	43.3	4120	1431* 8	68-131
74-98-6	Propane	66.8	60.6	172	174*	69-131
75-28-5	Isobutane	8.41	72.5	93.3	117	72-131
106-97-8	Butane	10.3	76.6	101	119	66-128

⁽a) Outside control limits due to high level in sample relative to spike amount.



⁽b) Result is from Run #2.

^{* =} Outside of Control Limits.

Method: RSKSOP-147/175

# **Duplicate Summary Job Number:** TC20876

PESTXST EarthCon Consultants Account:

**Project:** Quarterly Well Sampling, Parker County, Texas

Sample	File ID	DF	Analyzed	Ву	Prep Date	Prep Batch	<b>Analytical Batch</b>
TC20890-1DUP	SS005028.D	1	12/06/12	LT	n/a	n/a	GSS232
TC20890-1	SS005027.D	1	12/06/12	LT	n/a	n/a	GSS232
TC20890-1	SS005030.D	250	12/06/12	LT	n/a	n/a	GSS232

The QC reported here applies to the following samples:

TC20876-1

CAS No.	Compound	TC20890-1 ug/l Q	DUP ug/l	Q	RPD	Limits
74-82-8	Methane	20100 a	16400	E	21	53
74-85-1	Ethene	1.0 U	ND		nc	27
74-84-0	Ethane	3500 a	4020	E	14	43
74-98-6	Propane	66.8	99.1		39*	21
75-28-5	Isobutane	8.41	12.1		36*	35
106-97-8	Butane	10.3	15.1		38*	33

(a) Result is from Run #2.



^{* =} Outside of Control Limits.



### ANALYSIS REPORT

Lab #: 321084 Job #: 20030

Sample Name/Number: WW22-Sim-120112
Company: Oil Tracers, LLC
Date Sampled: 12/01/2012

Container: Dissolved Gas Bottle

Field/Site Name: Third Quarter Well Sampling

Location: Parker County, Texas

Formation/Depth:

Sampling Point:

Date Received: 12/05/2012 Date Reported: 2/01/2013

Component	Chemical mol. %	δ ¹³ C ‰	δD ‰	δ ¹⁸ Ο ‰
Carbon Monoxide	nd			
Hydrogen Sulfide	na			
Helium	na			
Hydrogen	nd			
Argon	1.42			
Oxygen	0.10			
Nitrogen	76.60			
Carbon Dioxide	0.20			
Methane	21.17	-44.40	-153.1	
Ethane	0.510	-23.1		
Ethylene	nd			
Propane	nd			
Propylene	nd			
Iso-butane	nd			
N-butane	0.0007			
Iso-pentane	0.0011			
N-pentane	nd			
Hexanes +	nd			

#### Remarks:

Analysis is of gas extracted from water by headspace equilibration. Analysis has been corrected for helium added to create headspace. Helium dilution factor = 0.73

nd = not detected. na = not analyzed. Isotopic composition of hydrogen is relative to VSMOW. Isotopic composition of carbon is relative to VPDB. Isotopic composition of oxygen is relative to VSMOW, except for carbon dioxide which is relative to VPDB. Calculations for BTU and specific gravity per ASTM D3588. Chemical compositions are normalized to 100%. Mol. % is approximately equal to vol. %.

^{*}Addition of helium negates the ability to detect native helium and may negate the ability to detect hydrogen.

^{**} Ethane isotopes obtained online via GC-C-IRMS



12/12/12



### Technical Report for

EarthCon Consultants

Quarterly Well Sampling, Parker County, Texas

3rd Quarter / WW24-Smi

Accutest Job Number: TC20880

Sampling Date: 11/30/12

### Report to:

EarthCon Consultants 4800 Sugar Grove Suite 420 Stafford, TX 77477

gfloreslovo@earthcon.com; djackson@jacksonsjoberg.com; mcpatton@rangeresources.com; escott@earthcon.com

ATTN: Gabriela Floreslovo

Total number of pages in report: 26



Test results contained within this data package meet the requirements of the National Environmental Laboratory Accreditation Conference and/or state specific certification programs as applicable.

Richard Rollriguez Laboratory Director

Client Service contact: Elessa Sommers 713-271-4700

Certifications: TX (T104704220-12-8) AR (11-028-0) AZ (AZ0769) FL (E87628) KS (E-10366) LA (85695/04004) OK (211-035)

This report shall not be reproduced, except in its entirety, without the written approval of Accutest Laboratories. Test results relate only to samples analyzed.

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# **Sample Summary**

EarthCon Consultants

TC20880 Job No:

Quarterly Well Sampling, Parker County, Texas Project No: 3rd Quarter / WW24-Smi

Sample Number	Collected Date		Received	Matr Code	<del></del>	Client Sample ID
rumber	Dutt	Time By	Received	Couc	Турс	Sumple 1D
TC20880-1	11/30/12	13:10	12/04/12	AQ	Ground Water	WW24-SMI-113012





### SAMPLE DELIVERY GROUP CASE NARRATIVE

Client: EarthCon Consultants Job No TC20880

Site: Quarterly Well Sampling, Parker County, Texas Report Date 12/12/2012 9:46:27 AM

1 Sample was collected on 11/30/2012 and received intact at Accutest on 12/04/2012 and properly preserved in 1 cooler at 2.4 Deg C. The sample received an Accutest job number of TC20880. A listing of the Laboratory Sample ID, Client Sample ID and date of collection are presented in the Results Summary Section of this report.

Except as noted below, all method specified calibrations and quality control performance criteria were met for this job. For more information, please refer to QC summary pages.

### Volatiles by GCMS By Method SW846 8260B

Matrix AQ Batch ID: VX1673

- All samples were analyzed within the recommended method holding time.
- All method blanks for this batch meet method specific criteria.
- Sample(s) TC20864-1MS, TC20864-1MSD were used as the QC samples indicated.

#### Volatiles by GC By Method RSKSOP-147/175

Matrix AQ Batch ID: GSS233

- All samples were analyzed within the recommended method holding time.
- All method blanks for this batch meet method specific criteria.
- Sample(s) TC20879-1DUP, TC20970-2MS were used as the QC samples indicated.
- Matrix Spike Recovery for Methane is outside control limits. Outside control limits due to high level in sample relative to spike
- TC20970-2MS: Sample was not preserved to a pH < 2.

Accutest Laboratories Gulf Coast (ALGC) certifies that this report meets the project requirements for analytical data produced for the samples as received at ALGC and as stated on the COC. ALGC certifies that the data meets the Data QualityObjectives for precision, accuracy and completeness as specified in the ALGC Quality Manual except as noted above. This report is to be used in its entirety. ALGC is not responsible for any assumptions of data quality if partial data packages are used



**Summary of Hits Job Number:** TC20880

Account: EarthCon Consultants

Quarterly Well Sampling, Parker County, Texas 11/30/12**Project:** 

Collected:

Lab Sample ID Analyte	Client Sample ID	Result/ Qual	MQL	SDL	Units	Method
TC20880-1	WW24-SMI-11301	12				
Methane Ethane		0.117 0.0136	0.00050 0.0010	0.00030 0.00050	mg/l mg/l	RSKSOP-147/175 RSKSOP-147/175



Sample Results	
Report of Analysis	



### 4

## **Report of Analysis**

Client Sample ID: WW24-SMI-113012

 Lab Sample ID:
 TC20880-1
 Date Sampled:
 11/30/12

 Matrix:
 AQ - Ground Water
 Date Received:
 12/04/12

 Method:
 SW846 8260B
 Percent Solids:
 n/a

**Project:** Quarterly Well Sampling, Parker County, Texas

	File ID	DF	Analyzed	By	<b>Prep Date</b>	Prep Batch	<b>Analytical Batch</b>
Run #1	X0087077.D	1	12/06/12	CF	n/a	n/a	VX1673
Run #2							

	Purge Volume	
Run #1	5.0 ml	
Run #2		

### **Purgeable Aromatics**

CAS No.	Compound	Result	MQL	SDL	Units	Q
71-43-2 108-88-3 100-41-4 1330-20-7	Benzene Toluene Ethylbenzene Xylene (total)	0.00034 U 0.00033 U 0.00032 U 0.00087 U	0.0010 0.0010 0.0010 0.0030	0.00034 0.00033 0.00032 0.00087	mg/l mg/l mg/l mg/l	
CAS No.	<b>Surrogate Recoveries</b>	Run# 1	Run# 2	Limits		
1868-53-7 17060-07-0 2037-26-5 460-00-4	Dibromofluoromethane 1,2-Dichloroethane-D4 Toluene-D8 4-Bromofluorobenzene	107% 94% 98% 99%		72-122% 68-124% 80-119% 72-126%		

 $\begin{array}{ll} U = & Not \; detected & SDL \; - \; Sample \; Detection \; Limit \\ MQL = & Method \; Quantitation \; Limit \\ \end{array}$ 

E = Indicates value exceeds calibration range

J = Indicates an estimated value

B = Indicates analyte found in associated method blank N = Indicates presumptive evidence of a compound



### 4

## **Report of Analysis**

Client Sample ID: WW24-SMI-113012

 Lab Sample ID:
 TC20880-1
 Date Sampled:
 11/30/12

 Matrix:
 AQ - Ground Water
 Date Received:
 12/04/12

 Method:
 RSKSOP-147/175
 Percent Solids:
 n/a

**Project:** Quarterly Well Sampling, Parker County, Texas

		File ID	DF	Analyzed	By	<b>Prep Date</b>	<b>Prep Batch</b>	<b>Analytical Batch</b>	
Rι	ın #1	SS005071.D	1	12/07/12	LT	n/a	n/a	GSS233	
Rι	ın #2								

### **RSK147 Special List**

CAS No.	Compound	Result	MQL	SDL	Units	Q
74-82-8	Methane	0.117	0.00050	0.00030	mg/l	
74-85-1	Ethene	0.00050 U	0.0010	0.00050	mg/l	
74-84-0	Ethane	0.0136	0.0010	0.00050	mg/l	
74-98-6	Propane	0.00075 U	0.0015	0.00075	mg/l	
75-28-5	Isobutane	0.00075 U	0.0015	0.00075	mg/l	
106-97-8	Butane	0.00075 U	0.0015	0.00075	mg/l	

U = Not detected SDL - Sample Detection Limit

MQL = Method Quantitation Limit

E = Indicates value exceeds calibration range

J = Indicates an estimated value

B = Indicates analyte found in associated method blank N = Indicates presumptive evidence of a compound





Misc. Forms

Custody Documents and Other Forms

Includes the following where applicable:

- Chain of Custody
- LRC Form



PAGE __ OF __

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Laboratories		in Dr, Ste 150 Housto 271-4700 FAX: 71					Accutest Q	uote#			Accute	st Job#	-10	10/	(1883)
	1 LL: 710-2	www.accutest.com												00	000
Client / Reporting Information	Project In	formation				100			Req	ueste	d Ana	lyses	-		Matrix Codes
Company Name Project Name:								.		1				İ	1
	ell Sampling, Parker Co	ounty. Texas						Butane, Ethane, Ethene, Isobutane, Methane, Propane by RSK-175							DW - Drinking Water
Street Address Street	ch dampinig; randi da		0.9950000000	iatists)/ii				E		1			İ		GW - Ground Water
4800 Sugar Grove Blvd., Suite 390		Billing Information (	( if different	t from Repo	ort to)		] [3								WW - Water SW - Surface Water
City State Zip City		Company Name											1		SO - Soil
Stafford TX 77477									1 1	- 1	i	1 1			SL- Sludge SED-Sediment
Project Contact E-mail Project #		Street Address						<u> </u>					1		OI - Oil LIQ - Other Liquid
Gabriela Floreslovo								e,				1 1		-	AIR - Air
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Sample# Field ID / Point of Collection Date	Time Sampled By	Matrix bottles 5	ĭ z a s	t H Z	5 2 F Z	m 0	ш,		_		_		-+		E ID COL GIALIT
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TC20880: Chain of Custody Page 1 of 4





### **Accutest Laboratories Sample Receipt Summary**

Accutest Job Number: TC20	0880	Client:	EARTHCO	N CON	SULTANT	S	Project:	3RD QTR WEL	L SAMPLI	NG,P	ARKE	R COUNTY,T
Date / Time Received: 12/4/	2012		Delivery N	lethod:		Client	Airbill #'s:					
No. Coolers: 1	Therm ID:	IR6					Temp Adjus	tment Factor:	0.2			
Cooler Temps (Initial/Adjuste	ed): #1: (2.2	2/2.4)										
Cooler Security Y	or N			<u> Y o</u>	r N	Sample Integri	ity - Docume	ntation_	<u>Y</u>	or	N	
1. Custody Seals Present:		3. COC P		<b>✓</b>		Sample labels	s present on bo	ttles:	<b>~</b>			
2. Custody Seals Intact: ✓	_ 4	. Smpl Date	s/Time OK	✓		2. Container lab	eling complete:		✓			
Cooler Temperature	Y or N	<u>L</u>				3. Sample conta	iner label / CO	C agree:	✓			
1. Temp criteria achieved:	<b>v</b>					Sample Integr	rity - Conditio	on	ΥΥ	or	N	
Cooler temp verification:	Infared G					Sample recvd		_	<b>✓</b>			
3. Cooler media:	Ice (ba	g)				2. All containers	accounted for:		<b>✓</b>			
Quality Control Preservation	Y or	N N/A	_	WTB	STB	3. Condition of s	ample:			Intact		
1. Trip Blank present / cooler:	<b>v</b>			✓		Sample Integr	rity - Instructi	ions	Υ	or	N	N/A
2. Trip Blank listed on COC:						1. Analysis requ	uested is clear:		<b>~</b>			
3. Samples preserved properly:	✓ [					2. Bottles receiv	ved for unspeci	fied tests			<b>✓</b>	
4. VOCs headspace free:						3. Sufficient vol	ume recvd for a	analysis:	<b>✓</b>			
						4. Compositing	instructions cle	ear:				<b>~</b>
						<ol><li>Filtering instr</li></ol>	uctions clear:					<b>✓</b>
Comments -Received trip blank -Received one of si			ger than pea	a size.								

TC20880: Chain of Custody

Page 1 of 3

Page 2 of 4







### **Problem Resolution**

Accutest Job Number: TC20880

CSR: Elessa Sommers Response Date: 12/5/2012

Response: Trip blank is on separate report. Sufficient number of vials without headspace are available for the

requested analyses.

1

TC20880: Chain of Custody

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### Sample Receipt Log

 Job #:
 TC20880
 Date / Time Received:
 12/4/2012 9:22:00 AM
 Initials:
 CH

Client: EARTHCON CONSULTANTS

Cooler #	Sample ID:	Vol	Bot #	Location	Pres	рН	Therm ID	Initial Temp	Therm CF	Corrected Temp
1	TC20880-1	40ml	1	VR	HCL	Note #1 - Preservative to be checked by analyst at the instrument.	IR6	2.2	0.2	2.4
1	TC20880-1	40ml	2	VR	HCL	Note #1 - Preservative to be checked by analyst at the instrument.	IR6	2.2	0.2	2.4
1	TC20880-1	40ml	3	VR	HCL	Note #1 - Preservative to be checked by analyst at the instrument.	IR6	2.2	0.2	2.4
1	TC20880-1	40ml	4	VR	HCL	Note #1 - Preservative to be checked by analyst at the instrument.	IR6	2.2	0.2	2.4
1	TC20880-1	40ml	5	VR	HCL	Note #1 - Preservative to be checked by analyst at the instrument.	IR6	2.2	0.2	2.4
1	TC20880-1	40ml	6	VR	HCL	Note #1 - Preservative to be checked by analyst at the instrument.	IR6	2.2	0.2	2.4

TC20880: Chain of Custody

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# Appendix A Laboratory Data Package Cover Page

TC20880 This data package consists of

[]

Richard Rodriguez

Ģ			list, and the following reportable data:	
Ģ	R1	Field chain-of-custody documentation		
Ģ	R2	Sample identification cross-reference		
Ģ	R3	Test reports (analytical data sheets) f	or each environmental sample that includes:	
		a)	Items consistent with NELAC 5.13 or ISO/IEC	17025 Section 5.10
		b)	dilution factors,	
		c)	preparation methods,	
		d)	cleanup methods, and	
		e)	if required for the project, tentatively identified	d compounds (TICs).
Ģ	R4	Surrogate recovery data including:		
		a)	Calculated recovery (%R), and	
		b)	The laboratory's surrogate QC limits.	
	R5	Test reports/summary forms for blank	samples;	
	R6	Test reports/summary forms for labor	ratory control samples (LCSs) including:	
		a)	LCS spiking amounts,	
		b)	Calculated %R for each analyte, and	
		c)	The laboratory's LCS QC limits.	
	R7	,	natrix spike duplicates (MS/MSDs) including:	
-		a)	Samples associated with the MS/MSD clearly	/ identified
		b)	MS/MSD spiking amounts,	, identifica,
		c)	Concentration of each MS/MSD analyte measurements	sured in the parent and
		d)	Calculated %Rs and relative percent different	
		e)	The laboratory's MS/MSD QC limits	bes (IXI Ds), and
п	R8	,		
ē	No	Laboratory analytical duplicate (if app		anta
		a)	The amount of analyte measured in the dupli	cale,
		b)	The calculated RPD, and	
_	Do	c)	The laboratory's QC limits for analytical dupli	
	R9		QLs) and detectability check sample results for	each analyte for each
Ģ	R10	Other problems or anomalies.		
			item in Laboratory Review Checklist and for e	
metrod for	WINCITUICI	aboratory does not note iverace accre	anation ander the rexas Eaboratory Accreate	norr rogram.
Texas Lab the Except requirement affirm to the	oratory Acci ion Report. nts of the made best of my	editation Program for all the methods, This data package has been reviewed ethods used, except where noted by the v knowledge, all problems/anomalies,	s laboratory data package. This laboratory is N analytes, and matrices reported in this data p I by the laboratory and is complete and technic all laboratory in the attached exception reports observed by the laboratory as having the poteratory Review Checklist, and no information or	ackage except as noted in cally compliant with the  . By my signature below, I ntial to affect the quality of
Check, if a	applicable:	This laboratory meets an exception u	nder 30 TAC&25.6 and was last inspection by	•
[] QA Manag	ier	noted in the Exception Reports herein	011. Any findings affecting the data in this labon. The official signing the cover page of the reputate package and is by signature affirming the	oort in which these data are
Name (Pri		Signature	Official Title (printed)	Date
ranic (r III	nou)	Olgitaturo	omoiai i nio (printou)	Date

Laboratory Director

12/12/2012



	ı	ABORATORY REVIEW O	HECKLIST: REPORTABLE	DAT	Δ.					
Laboratory		Accutest Gulf Coast	LRC Date:		/12/2	012				
Laboratory	radiio.	Quarterly Well Sampling, Parker	ENO Bale.	.2/12/2012						
Project Na	me:	County, Texas	TC20880							
Reviewer	Name:	Anita Patel	GSS233, VX1673							
#1	A ²	DESCRIPTION	Prep Batch Number(s):					ER#5		
R1	OI	CHAIN-OF-CUSTODY (C-O-C):								
			andard conditions of sample acceptability			Г	Г			
		upon receipt?		X						
		Were all departures from standard co	Х							
R2	OI	Sample and quality control (QC) id	entification							
		Are all field sample ID numbers cross	s-referenced to the laboratory ID numbers?	Х						
		Are all laboratory ID numbers cross-re	Х							
R3	OI	Test reports								
		Were samples prepared and analyze	d within holding times?	Х						
		Other than those results <mql, td="" were<=""><td>all other raw values bracketed by calibration</td><td>X</td><td></td><td></td><td></td><td></td></mql,>	all other raw values bracketed by calibration	X						
		standards?		_ ^						
		Were calculations checked by a peer	·	Х						
		Were all analyte identifications check		Х						
		Were sample detection limits reported		Х						
			samples reported on a dry weight basis?			Х				
		Were % moisture (or solids) reported				Х				
			platile analysis extracted with methanol per			Х				
		SW846 Method 5035?		-						
R4		If required for the project, are TIC's re	еропеа?			Х				
K4	0	Surrogate recovery data  Were surrogates added prior to extra	otion?	X						
			all samples within the laboratory QC limits?	<del>  ^</del>						
R5	OI	Test reports/summary forms for bl	· · · · · · · · · · · · · · · · · · ·	<del>  ^</del>						
		Were appropriate type(s) of blanks as		Х						
		Were blanks analyzed at the appropri		X						
			he entire analytical process, including							
		preparation and, if applicable, cleanu		X						
		Were blank concentrations <mql?< td=""><td>F F</td><td>X</td><td></td><td></td><td></td><td></td></mql?<>	F F	X						
R6	OI	Laboratory control samples (LCS):								
•		Were all COCs included in the LCS?		Х						
		Was each LCS taken through the ent	tire analytical procedure, including prep and	Х						
		cleanup steps?		^						
		Were LCSs analyzed at required free		Х						
		Were LCS (and LCSD, if applicable)		X						
			data document the laboratory's capability to	X				5		
		detect the COCs at the MDL used to		<b>↓</b> ``	-		<u> </u>	<u> </u>		
	<u> </u>	Was the LCSD RPD within QC limits				Х				
R7	OI	Matrix spike (MS) and matrix spike		V						
		Were MS/MSD analyzed at the appro	nalytes included in the MS and MSD?	X	-					
		Were MS (and MSD, if applicable) %		+^	Х	<u> </u>	<u> </u>	4		
		Were the MS/MSD RPDs within labo		X	_			-		
R8	OI	Analytical duplicate data	ratory &O minito:	$\perp$						
	- 01	Were appropriate analytical duplicate	es analyzed for each matrix?	X				ı		
		Were analytical duplicates analyzed		X	$\vdash$	<del>                                     </del>	<del>                                     </del>			
			ations within the laboratory QC limits?	X						
R9	OI	Method quantitation limits (MQLs):	·	- A						
	<u> </u>		te included in the laboratory data package?	Х				I		
			entration of the lowest non-zero calibration	X						
			luded in the laboratory data package?		Х			2		
R10	OI	Other problems/anomalies	, ,							
		Are all known problems/anomalies/sp	pecial conditions noted in this LRC and ER?	Х						
		Was applicable and available techno	logy used to lower the SDL to minimize the	Х						
		Is the laboratory NELAC-accredited u								
		Program for the analytes, matrices, a	X		l	l	3			
		data package?		<u></u>	L	L_	L_	<u> </u>		



Laboratory Name:		Accutest Gulf Coast	LRC Date:	12/12/2012					
Project Na	me:	Quarterly Well Sampling, Parker	r Laboratory Project Number:		2088	0			
Reviewer	Name:	Anita Patel	Prep Batch Number(s):	GSS	233,	VX16	73		
#1	A ²	DESCRIPTION		YES	NO	$NA^3$	NR⁴	ER#5	
S1	OI	Initial calibration (ICAL)							
		Were response factors and/or relative	e response factors for each analyte within QC	х					
		limits?		X					
		Were percent RSDs or correlation co	/ere percent RSDs or correlation coefficient criteria met?						
			mended in the method used for all analytes?	Χ					
			ne lowest and highest standard used to	х					
		calculate the curve?							
		Are ICAL data available for all instrun		Х					
			verified using an appropriate second source	l x l					
		standard?			$\Box$				
S2	OI		erification (ICCV AND CCV) and continuing				_		
		Was the CCV analyzed at the method		Х					
			alyte within the method-required QC limits?	Х					
		Was the ICAL curve verified for each		Х					
			e concentration in the inorganic CCB <mdl?< th=""><th></th><th></th><th>Х</th><th></th><th></th></mdl?<>			Х			
S3	0	Mass spectral tuning	a mostly and consider to minute	V			_		
		Was the appropriate compound for th		X					
		Were ion abundance data within the	method-required QC limits?	^					
S4	0		Internal standards (IS) Were IS area counts and retention times within the method-required QC limits?						
S5	OI	Raw data (NELAC Section 5.5.10)	Х				_		
	0	Were the raw data (for example, chro				_			
		analyst?	Х						
		Were data associated with manual in	Х						
S6	0	Dual column confirmation	_^_						
		Did dual column confirmation results			Х				
S7	0	Tentatively identified compounds							
			s spectra and TIC data subject to appropriate						
		checks?				Х			
S8	ı	Interference Check Sample (ICS) r	esults						
		Were percent recoveries within method	od QC limits?			Х			
S9	ı	Serial dilutions, post digestion spi	kes, and method of standard additions						
		Were percent differences, recoveries	, and the linearity within the QC limits			Х			
		specified in the method?				^			
S10	OI	Method detection limit (MDL) studi	es						
		Was a MDL study performed for each		Х					
		Is the MDL either adjusted or support	ed by the analysis of DCSs?	Χ				5	
S11	OI	Proficiency test reports							
			ceptable on the applicable proficiency tests or	l x l					
		evaluation studies?							
S12	OI	Standards documentation	NOT : II II II				_		
		•	s NIST-traceable or obtained from other	х					
<u> </u>		appropriate source?							
S13	OI	Compound/analyte identification p		V			-		
614	0	Are the procedures for compound/and	•	Х					
S14	OI	Demonstration of analyst compete Was DOC conducted consistent with		V 1					
		Is documentation of the analyst's com		X	-				
S15	OI	· · · · · · · · · · · · · · · · · · ·	ion for methods (NELAC Chapter 5)						
313	J J		the data documentated, verified, and						
		validated, where applicable?	ine data documentated, vermed, allu	Х					
S16	OI	Laboratory standard operating pro	ocaduras (SOPs)						
310	J 01			Х					
	Are laboratory SOPs current and on file for each method performed?								



aboratory	Name:	Accutest Gulf Coast	LRC Date:	12/12/2012						
Project Na	me:	Quarterly Well Sampling, Parke	r Laboratory Project Number:	TC20880						
Reviewer	ewer Name: Anita Patel		Prep Batch Number(s):	GSS233, VX1673						
ER# ¹	Description									
	For report	ing purposes, the MQL is defined in the	he report as the RL. The unadjusted MQL	/RL is reported in the method						
1		e SDL is defined in the report as the N								
	For reporting purposes, the method blank represents the unadjusted MQL. The DCS is on file in the laboratory and is not									
2	included in the laboratory data package.									
	The laboratory is NELAC-accredited under the Texas Laboratory Accreditation Program for the analytes, matrices, and									
3	methods a	associated with this laboratory data pa	ckage for analytes that are listed in the Te	exas Fields of Accreditation.						
4	All anoma	lies are discussed in the case narrativ	re.							
			for Method RSKSOP-147/175. The comp	onents reported are not listed or						
5	do not hav	ve values in the Texas TRRP PCL tab	oles.							

¹ER# = Exception Report identification number (an Exception Report should be completed for an item if "NR" or "No" is checked on



## GC/MS Volatiles

QC Data Summaries

Includes the following where applicable:

- Method Blank Summaries
- Blank Spike Summaries
- Matrix Spike and Duplicate Summaries



**Method:** SW846 8260B

# Method Blank Summary Job Number: TC20880

Job Number:

PESTXST EarthCon Consultants Account:

**Project:** Quarterly Well Sampling, Parker County, Texas

Sample VX1673-MB	<b>File ID</b> X0087062.D	<b>DF</b> 1	<b>Analyzed</b> 12/06/12	<b>By</b> CF	<b>Prep Date</b> n/a	<b>Prep Batch</b> n/a	<b>Analytical Batch</b> VX1673

The QC reported here applies to the following samples:

CAS No.	Compound	Result	RL	MDL	Units Q
71-43-2	Benzene	ND	1.0	0.34	ug/l
100-41-4	Ethylbenzene	ND	1.0	0.32	ug/l
108-88-3	Toluene	ND	1.0	0.33	ug/l
1330-20-7	Xylene (total)	ND	3.0	0.87	ug/l

CAS No.	<b>Surrogate Recoveries</b>		Limits
17060-07-0 2037-26-5	Dibromofluoromethane 1,2-Dichloroethane-D4 Toluene-D8 4-Bromofluorobenzene	105% 95% 99% 98%	72-122% 68-124% 80-119% 72-126%



**Method:** SW846 8260B

# Blank Spike Summary Job Number: TC20880

Account: PESTXST EarthCon Consultants

Quarterly Well Sampling, Parker County, Texas **Project:** 

Sample VX1673-BS	<b>File ID</b> X0087060.D	<b>DF</b> 1	<b>Analyzed</b> 12/06/12	By CF	<b>Prep Date</b> n/a	<b>Prep Batch</b> n/a	<b>Analytical Batch</b> VX1673

The QC reported here applies to the following samples:

CAS No.	Compound	Spike ug/l	BSP ug/l	BSP %	Limits
71-43-2	Benzene	25	22.2	89	68-119
100-41-4	Ethylbenzene	25	22.1	88	71-117
108-88-3	Toluene	25	22.4	90	73-119
1330-20-7	Xylene (total)	75	67.7	90	74-119

CAS No.	<b>Surrogate Recoveries</b>	BSP	Limits
17060-07-0 2037-26-5	Dibromofluoromethane 1,2-Dichloroethane-D4 Toluene-D8 4-Bromofluorobenzene	101% 99% 101% 92%	72-122% 68-124% 80-119% 72-126%



^{* =} Outside of Control Limits.

# 6.3.1

Page 1 of 1

**Method:** SW846 8260B

# Matrix Spike/Matrix Spike Duplicate Summary

Job Number: TC20880

**Account:** PESTXST EarthCon Consultants

**Project:** Quarterly Well Sampling, Parker County, Texas

Sample	File ID	DF	Analyzed	Ву	Prep Date	Prep Batch	Analytical Batch
TC20864-1MS	X0087064.D	1	12/06/12	CF	n/a	n/a	VX1673
TC20864-1MSD	X0087065.D	1	12/06/12	CF	n/a	n/a	VX1673
TC20864-1	X0087063.D	1	12/06/12	CF	n/a	n/a	VX1673

The QC reported here applies to the following samples:

CAS No.	Compound	TC20864-1 ug/l Q	Spike ug/l	MS ug/l	MS %	MSD ug/l	MSD %	RPD	Limits Rec/RPD
71-43-2	Benzene	1.0 U	25	23.0	92	22.4	90	3	68-119/12
100-41-4	Ethylbenzene	1.0 U	25	22.7	91	22.4	90	1	71-117/12
108-88-3	Toluene	1.0 U	25	22.9	92	22.5	90	2	73-119/13
1330-20-7	Xylene (total)	3.0 U	75	69.8	93	68.4	91	2	74-119/13

CAS No.	<b>Surrogate Recoveries</b>	MS MSD		TC20864-1	Limits	
1868-53-7	Dibromofluoromethane	103%	101%	105%	72-122%	
17060-07-0	1,2-Dichloroethane-D4	98%	98%	96%	68-124%	
2037-26-5	Toluene-D8	100%	100%	100%	80-119%	
460-00-4	4-Bromofluorobenzene	91%	92%	98%	72-126%	

^{* =} Outside of Control Limits.



## GC Volatiles

# QC Data Summaries

### Includes the following where applicable:

- Method Blank Summaries
- Blank Spike Summaries
- Matrix Spike and Duplicate Summaries



Method: RSKSOP-147/175

# Method Blank Summary Job Number: TC20880

Account: PESTXST EarthCon Consultants

Quarterly Well Sampling, Parker County, Texas **Project:** 

Sample GSS233-MB	<b>File ID</b> SS005056.D	<b>DF</b> 1	<b>Analyzed</b> 12/07/12	By LT	<b>Prep Date</b> n/a	<b>Prep Batch</b> n/a	Analytical Batch GSS233

The QC reported here applies to the following samples:

CAS No.	Compound	Result	RL	MDL	Units Q
74-82-8	Methane	ND	0.50	0.30	ug/l
74-85-1	Ethene	ND	1.0	0.50	ug/l
74-84-0	Ethane	ND	1.0	0.50	ug/l
74-98-6	Propane	ND	1.5	0.75	ug/l
75-28-5	Isobutane	ND	1.5	0.75	ug/l
106-97-8	Butane	ND	1.5	0.75	ug/l



Method: RSKSOP-147/175

# Blank Spike Summary Job Number: TC20880

Account: PESTXST EarthCon Consultants

Quarterly Well Sampling, Parker County, Texas **Project:** 

Sample GSS233-BS	<b>File ID</b> SS005054.D	<b>DF</b> 1	<b>Analyzed</b> 12/07/12	By LT	Prep Date n/a	Prep Batch n/a	Analytical Batch GSS233

The QC reported here applies to the following samples:

CAS No.	Compound	Spike ug/l	BSP ug/l	BSP %	Limits
74-82-8	Methane	21.5	16.2	75	68-139
74-85-1	Ethene	57.4	43.2	75	52-145
74-84-0	Ethane	43.3	47.1	109	68-131
74-98-6	Propane	60.6	60.5	100	69-131
75-28-5	Isobutane	72.5	70.4	97	72-131
106-97-8	Butane	76.6	73.6	96	66-128



^{* =} Outside of Control Limits.

Method: RSKSOP-147/175

# **Matrix Spike Summary**

Job Number: TC20880

**Account:** PESTXST EarthCon Consultants

**Project:** Quarterly Well Sampling, Parker County, Texas

Sample TC20970-2MS ^a TC20970-2 ^a	<b>File ID</b> SS005067.D SS005066.D	<b>Analyzed</b> 12/07/12 12/07/12	By LT LT	Prep Date n/a n/a	Prep Batch n/a n/a	Analytical Batch GSS233 GSS233

The QC reported here applies to the following samples:

CAS No.	Compound	TC20970-2 ug/l Q	Spike ug/l	MS ug/l	MS %	Limits
74-82-8	Methane	105	21.5	95.8	-42* b	68-139
74-85-1	Ethene	ND	57.4	46.6	81	52-145
74-84-0	Ethane	4.71	43.3	46.7	97	68-131
74-98-6	Propane	ND	60.6	53.4	88	69-131
75-28-5	Isobutane	ND	72.5	61.8	85	72-131
106-97-8	Butane	ND	76.6	66.0	86	66-128

⁽a) Sample was not preserved to a pH < 2.



⁽b) Outside control limits due to high level in sample relative to spike amount.

^{* =} Outside of Control Limits.

Method: RSKSOP-147/175

# **Duplicate Summary Job Number:** TC20880

**Account:** PESTXST EarthCon Consultants

**Project:** Quarterly Well Sampling, Parker County, Texas

Sample TC20879-1DUP TC20879-1	File ID SS005062.D SS005061.D	Analyzed 12/07/12 12/07/12	By LT LT	Prep Date n/a n/a	Prep Batch n/a n/a	Analytical Batch GSS233 GSS233

The QC reported here applies to the following samples:

CAS No.	Compound	TC20879-1 ug/l Q	DUP ug/l Q	RPD	Limits
74-82-8	Methane	4.10	3.34	20	53
74-85-1	Ethene	1.0 U	ND	nc	27
74-84-0	Ethane	1.0 U	ND	nc	43
74-98-6	Propane	1.5 U	ND	nc	21
75-28-5	Isobutane	1.5 U	ND	nc	35
106-97-8	Butane	1.5 U	ND	nc	33



^{* =} Outside of Control Limits.



### ANALYSIS REPORT

Lab #: 321080 Job #: 20030

Sample Name/Number: WW24-SMI-113012
Company: Oil Tracers, LLC

Date Sampled: 11/30/2012

Container: Dissolved Gas Bottle

Field/Site Name: Third Quarter Well Sampling

Location: Parker County, Texas

Formation/Depth:

Sampling Point:

Date Received: 12/05/2012 Date Reported: 2/01/2013

Component	Chemical mol. %	δ ¹³ C ‰	δD ‰	δ ¹⁸ Ο ‰
Carbon Monoxide	nd			
Hydrogen Sulfide	na			
Helium	na			
Hydrogen	nd			
Argon	1.57			
Oxygen	16.65			
Nitrogen	79.76			
Carbon Dioxide	0.31			
Methane	1.66	-43.1	-127	
Ethane	0.0501			
Ethylene	nd			
Propane	0.0013			
Propylene	nd			
Iso-butane	nd			
N-butane	nd			
Iso-pentane	nd			
N-pentane	nd			
Hexanes +	nd			

#### Remarks:

Analysis is of gas extracted from water by headspace equilibration. Analysis has been corrected for helium added to create headspace. Helium dilution factor = 0.77

nd = not detected. na = not analyzed. Isotopic composition of hydrogen is relative to VSMOW. Isotopic composition of carbon is relative to VPDB. Isotopic composition of oxygen is relative to VSMOW, except for carbon dioxide which is relative to VPDB. Calculations for BTU and specific gravity per ASTM D3588. Chemical compositions are normalized to 100%. Mol. % is approximately equal to vol. %.

^{*}Addition of helium negates the ability to detect native helium and may negate the ability to detect hydrogen.



12/12/12



## Technical Report for

EarthCon Consultants

Quarterly Well Sampling, Parker County, Texas

3rd Quarter / WW13-Str

Accutest Job Number: TC20886

Sampling Date: 12/02/12

### Report to:

EarthCon Consultants 4800 Sugar Grove Suite 420

Stafford, TX 77477

gfloreslovo@earthcon.com; djackson@jacksonsjoberg.com; mcpatton@rangeresources.com; escott@earthcon.com

ATTN: Gabriela Floreslovo

Total number of pages in report: 26



Test results contained within this data package meet the requirements of the National Environmental Laboratory Accreditation Conference and/or state specific certification programs as applicable.

Richard Rollriguez Laboratory Director

Client Service contact: Elessa Sommers 713-271-4700

Certifications: TX (T104704220-12-8) AR (11-028-0) AZ (AZ0769) FL (E87628) KS (E-10366) LA (85695/04004) OK (211-035)

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TC20886 LABORATORIE

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# **Sample Summary**

EarthCon Consultants

Job No:

TC20886

Quarterly Well Sampling, Parker County, Texas Project No: 3rd Quarter / WW13-Str

Sample Collected			Matr		Client	
Number	Date	Time By	Received	Code	Type	Sample ID
TC20886-1	12/02/12	13:00	12/04/12	AQ	Ground Water	WW13-STR-120212





### SAMPLE DELIVERY GROUP CASE NARRATIVE

Client: EarthCon Consultants Job No TC20886

Site: Quarterly Well Sampling, Parker County, Texas Report Date 12/12/2012 9:00:30 AM

1 Sample was collected on 12/02/2012 and received intact at Accutest on 12/04/2012 and properly preserved in 1 cooler at 2.4 Deg C. The sample received an Accutest job number of TC20886. A listing of the Laboratory Sample ID, Client Sample ID and date of collection are presented in the Results Summary Section of this report.

Except as noted below, all method specified calibrations and quality control performance criteria were met for this job. For more information, please refer to QC summary pages.

### Volatiles by GCMS By Method SW846 8260B

Matrix AO Batch ID: VK578

- All samples were analyzed within the recommended method holding time.
- All method blanks for this batch meet method specific criteria.
- Sample(s) TC20506-1MS, TC20506-1MSD were used as the QC samples indicated.

#### Volatiles by GC By Method RSKSOP-147/175

Matrix AQ Batch ID: GSS234

- All samples were analyzed within the recommended method holding time.
- All method blanks for this batch meet method specific criteria.
- Sample(s) TC21021-1DUP, TC21021-2MS were used as the QC samples indicated.
- Matrix Spike Recovery for Ethane is outside control limits. Probable cause due to matrix interference.

Accutest Laboratories Gulf Coast (ALGC) certifies that this report meets the project requirements for analytical data produced for the samples as received at ALGC and as stated on the COC. ALGC certifies that the data meets the Data QualityObjectives for precision, accuracy and completeness as specified in the ALGC Quality Manual except as noted above. This report is to be used in its entirety. ALGC is not responsible for any assumptions of data quality if partial data packages are used



**Summary of Hits Job Number:** TC20886

Account: EarthCon Consultants

Quarterly Well Sampling, Parker County, Texas 12/02/12 **Project:** 

Collected:

Lab Sample ID Analyte	Client Sample ID	Result/ Qual	MQL	SDL	Units	Method
TC20886-1	WW13-STR-1202	12				
Methane Ethane		5.64 0.779	0.025 0.050	0.015 0.025	mg/l mg/l	RSKSOP-147/175 RSKSOP-147/175



Sample Results		
Report of Analysis		



### 4

## **Report of Analysis**

Client Sample ID: WW13-STR-120212

 Lab Sample ID:
 TC20886-1
 Date Sampled:
 12/02/12

 Matrix:
 AQ - Ground Water
 Date Received:
 12/04/12

 Method:
 SW846 8260B
 Percent Solids:
 n/a

**Project:** Quarterly Well Sampling, Parker County, Texas

	File ID	DF	Analyzed	$\mathbf{B}\mathbf{y}$	<b>Prep Date</b>	<b>Prep Batch</b>	<b>Analytical Batch</b>
Run #1	K13199.D	1	12/06/12	EM	n/a	n/a	VK578
Run #2							

	Purge Volume	
Run #1	5.0 ml	
Run #2		

### **Purgeable Aromatics**

CAS No.	Compound	Result	MQL	SDL	Units	Q
71-43-2 108-88-3 100-41-4 1330-20-7	Benzene Toluene Ethylbenzene Xylene (total)	0.00034 U 0.00033 U 0.00032 U 0.00087 U	0.0010 0.0010 0.0010 0.0030	0.00034 0.00033 0.00032 0.00087	mg/l mg/l mg/l mg/l	
CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits		
1868-53-7 17060-07-0 2037-26-5 460-00-4	Dibromofluoromethane 1,2-Dichloroethane-D4 Toluene-D8 4-Bromofluorobenzene	107% 107% 106% 102%		72-122% 68-124% 80-119% 72-126%		

 $\begin{array}{ll} U = & Not \; detected & SDL \; - \; Sample \; Detection \; Limit \\ MQL = & Method \; Quantitation \; Limit \\ \end{array}$ 

E = Indicates value exceeds calibration range

J = Indicates an estimated value

B = Indicates analyte found in associated method blank N = Indicates presumptive evidence of a compound



### 4

# **Report of Analysis**

Client Sample ID: WW13-STR-120212

 Lab Sample ID:
 TC20886-1
 Date Sampled:
 12/02/12

 Matrix:
 AQ - Ground Water
 Date Received:
 12/04/12

 Method:
 RSKSOP-147/175
 Percent Solids:
 n/a

**Project:** Quarterly Well Sampling, Parker County, Texas

	File ID	DF	Analyzed	By	<b>Prep Date</b>	Prep Batch	<b>Analytical Batch</b>
Run #1	SS005102.D	1	12/10/12	LT	n/a	n/a	GSS234
Run #2	SS005104.D	50	12/10/12	LT	n/a	n/a	GSS234

### **RSK147 Special List**

CAS No.	Compound	Result	MQL	SDL	Units	Q
74-82-8	Methane	5.64 a	0.025	0.015	mg/l	
74-85-1	Ethene	0.00050 U	0.0010	0.00050	mg/l	
74-84-0	Ethane	0.779 a	0.050	0.025	mg/l	
74-98-6	Propane	0.00075 U	0.0015	0.00075	mg/l	
75-28-5	Isobutane	0.00075 U	0.0015	0.00075	mg/l	
106-97-8	Butane	0.00075 U	0.0015	0.00075	mg/l	

(a) Result is from Run# 2

U = Not detected

SDL - Sample Detection Limit

MQL = Method Quantitation Limit

E = Indicates value exceeds calibration range

J = Indicates an estimated value

B = Indicates analyte found in associated method blank N = Indicates presumptive evidence of a compound





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1 V	ш	101	<b>-</b>		. ( )	"	ш	ш	

Custody Documents and Other Forms

Includes the following where applicable:

- Chain of Custody
- LRC Form



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															FE	ED-EX T	racking #		_		7	ottle Ord	er Contro	#			
4	Laboratories				10165 Harv TEL. 713	-271-4700	FAX:	713-27	X 770	036 70					- 1	Accutest Quote #						Accutest Job #			7	208806	
	Client / Reporting Information				Project			111 (100)			ink.	1998				_		F	l e q u	est	e d /	Analyses					Matrix Codes
	· · · · · · · · · · · · · · · · · · ·	1277522000000	Project Name:	MANAGER STREET	Tojecti				onengo																		
Company					No. of Taxana										ane,	-							į	١,	DW - Drinking Water		
arthCo	on Consultants, Inc.		Third Quarter	y vveii Samplii	ng, Parker C	ounty,	CXGS							at in			et P										GW - Ground Water WW - Water
	gar Grove Blvd., Suite 390					Billing Information ( if different from Report to)								_		Butane, Ethane, Ethene, Isobutane, Methane, Propane by RSK-175										SW - Surface Water	
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281-201	-3513														_		, ×			1					1		FB-Field Blank
Sampler	s) Name(s)	Phone #	Project Manager			Attention										m	R S	ļ	ļ	- 1			1				
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Accutest Sample #	Field ID / Point of Colle	ection	Date	Time	Sampled By	Matrix	# of bottles	호	ZAN	HNOS	NON	MEO!	13 13	NaH	E	ВТ	P. P.										LAB USE ONLY
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TC20886: Chain of Custody Page 1 of 4







### **Accutest Laboratories Sample Receipt Summary**

Accutest Job Number: TC20	Client:	EARTHCO	N CON	SULTANT	S	Project: 3RD QTR WELL SAMPLING, PARKER COUNTY, T						
Date / Time Received: 12/4/	2012		Delivery M	ethod:		Client	Airbill #'s:					
No. Coolers: 1	Therm ID:	IR6					Temp Adjus	ment Factor:	0.2			
Cooler Temps (Initial/Adjusted): #1: (2.2/2.4)												
Cooler Security Y	or N			Υo	r N_	Sample Integr	ity - Documer	ntation_	ΥΥ	or N		
Custody Seals Present:  ✓		3. COC P		✓		Sample label	s present on bo	ttles:	<b>~</b>			
2. Custody Seals Intact:	☐ 4.	Smpl Date	s/Time OK	✓		2. Container lab	eling complete:		<b>✓</b>			
Cooler Temperature	Y or N	<u>L</u>				3. Sample conta	ainer label / CO	C agree:	<b>✓</b>			
1. Temp criteria achieved:	<b>V</b>					Sample Integr	rity - Conditio	n	Υ	or N		
Cooler temp verification:	Infared G	un				Sample recvo	d within HT:		<b>✓</b>			
Cooler media:	Ice (baç	3)				2. All containers	s accounted for:		<b>~</b>			
<b>Quality Control Preservation</b>	Y or I	N N/A	_1	WTB	STB	3. Condition of s	sample:			Intact		
1. Trip Blank present / cooler:	<b>V</b>			<b>✓</b>		Sample Integr	rity - Instructi	ons	Υ	or N	N/A	
2. Trip Blank listed on COC:							uested is clear:		<u> </u>			
3. Samples preserved properly:	✓ [						ived for unspeci	fied tests		✓		
4. VOCs headspace free:	<b>v</b>					3. Sufficient vol	lume recvd for a	nalysis:	<b>✓</b>			
						4. Compositing	instructions cle	ar:			<b>✓</b>	
						5. Filtering instr	ructions clear:				<b>~</b>	
Comments -Received trip blank	not listed on (	COC.										

TC20886: Chain of Custody

Page 1 of 3

Page 2 of 4







### **Problem Resolution**

Accutest Job Number: TC20886

**CSR:** Elessa Sommers Response Date: 12/5/2012

Response: Trip blank is on separate report.

_

TC20886: Chain of Custody

Page 3 of 4







### Sample Receipt Log

 Job #:
 TC20886
 Date / Time Received:
 12/4/2012 9:22:00 AM
 Initials:
 CH

Client: EARTHCON CONSULTANTS

Cooler #	Sample ID:	Vol	Bot #	Location	Pres	рН	Therm ID	Initial Temp	Therm CF	Corrected Temp
1	TC20886-1	40ml	1	VR	HCL	Note #1 - Preservative to be checked by analyst at the instrument.	IR6	2.2	0.2	2.4
1	TC20886-1	40ml	2	VR	HCL	Note #1 - Preservative to be checked by analyst at the instrument.	IR6	2.2	0.2	2.4
1	TC20886-1	40ml	3	VR	HCL	Note #1 - Preservative to be checked by analyst at the instrument.	IR6	2.2	0.2	2.4
1	TC20886-1	40ml	4	VR	HCL	Note #1 - Preservative to be checked by analyst at the instrument.	IR6	2.2	0.2	2.4
1	TC20886-1	40ml	5	VR	HCL	Note #1 - Preservative to be checked by analyst at the instrument.	IR6	2.2	0.2	2.4
1	TC20886-1	40ml	6	VR	HCL	Note #1 - Preservative to be checked by analyst at the instrument.	IR6	2.2	0.2	2.4

TC20886: Chain of Custody

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# Appendix A Laboratory Data Package Cover Page TC20886 This data package consists of

This signature page, the laboratory review checklist, and the following reportable data:

[]

QA Manager Name (Printed)

Richard Rodriguez

is true.

Signature

	R1	Field chain-of-custody documentation;	3 4
·	R2	Sample identification cross-reference;	
	R3	Test reports (analytical data sheets) fo	r each environmental sample that includes:
		a) I	Items consistent with NELAC 5.13 or ISO/IEC 17025 Section 5.10
		b) 0	dilution factors,
		c) t	preparation methods,
		d)	cleanup methods, and
		e) i	if required for the project, tentatively identified compounds (TICs).
	R4	Surrogate recovery data including:	
		a)	Calculated recovery (%R), and
		b) -	The laboratory's surrogate QC limits.
	R5	Test reports/summary forms for blank	samples;
	R6	Test reports/summary forms for labora	tory control samples (LCSs) including:
		a) I	LCS spiking amounts,
		b) (	Calculated %R for each analyte, and
		c) -	The laboratory's LCS QC limits.
	R7		atrix spike duplicates (MS/MSDs) including:
		a)	Samples associated with the MS/MSD clearly identified,
		•	MS/MSD spiking amounts,
			Concentration of each MS/MSD analyte measured in the parent and
			Calculated %Rs and relative percent differences (RPDs), and
		•	The laboratory's MS/MSD QC limits
	R8	Laboratory analytical duplicate (if appli	
		,	The amount of analyte measured in the duplicate,
		•	The calculated RPD, and
			The laboratory's QC limits for analytical duplicates.
	R9		_s) and detectability check sample results for each analyte for each
	R10	Other problems or anomalies.	
			tem in Laboratory Review Checklist and for each analyte, matrix, and litation under the Texas Laboratory Accreditation Program.
Texas Lab the Except requireme affirm to th	oratory Accr tion Report. nts of the mo te best of my	reditation Program for all the methods, a This data package has been reviewed le ethods used, except where noted by the y knowledge, all problems/anomalies, ol	laboratory data package. This laboratory is NELAC accredited under the analytes, and matrices reported in this data package except as noted in by the laboratory and is complete and technically compliant with the alaboratory in the attached exception reports. By my signature below, I bserved by the laboratory as having the potential to affect the quality of tory Review Checklist, and no information or data have been knowingly
,	applicable:	This laboratory meets an exception un	der 30 TAC&25.6 and was last inspection by
[]		noted in the Exception Reports herein.	11. Any findings affecting the data in this laboratory data package are. The official signing the cover page of the report in which these data are that package and is by signature affirming the above release statement.

Official Title (printed)

Laboratory Director

Date 12/12/2012



	L	ABORATORY REVIEW C	HECKLIST: REPORTABLE	DAT	Ά			
Laboratory	Name:		LRC Date:	12/	12/2	012		
		Quarterly Well Sampling, Parker						
Project Na			Laboratory Project Number:	+	2088			
Reviewer			Prep Batch Number(s):			VK57		5
#1	A ²	DESCRIPTION		YES	NO	NA	NR⁴ E	R#°
R1	OI	CHAIN-OF-CUSTODY (C-O-C):					_	
		upon receipt?	ndard conditions of sample acceptability	Х				
			nditions described in an exception report?	X				
R2	OI	Sample and quality control (QC) ide		<del>  ^</del>	ш			
- 1\2	<u> </u>		referenced to the laboratory ID numbers?	X				
				l ^				
	01	•	ferenced to the corresponding QC data?	_ X	Ш			_
R3	OI	Test reports	Luithin halding times?	X		-		
		Were samples prepared and analyzed	all other raw values bracketed by calibration	1			-	
		standards?	all other raw values bracketed by calibration	X				
		Were calculations checked by a peer of	or supervisor?	X				
		Were all analyte identifications checke		X				
		Were sample detection limits reported	7 1 1	X			_	
			samples reported on a dry weight basis?	<del>  ^</del>	H	Х	-	
		Were % moisture (or solids) reported to		t -	H	X	_	
			atile analysis extracted with methanol per					
		SW846 Method 5035?				Х		
		If required for the project, are TIC's rep	ported?			Х		
R4	0	Surrogate recovery data						
		Were surrogates added prior to extrac	tion?	Х				
		Were surrogate percent recoveries in	all samples within the laboratory QC limits?	Х				
R5	OI	Test reports/summary forms for bla	ank samples					
		Were appropriate type(s) of blanks and	alyzed?	Х				
		Were blanks analyzed at the appropria		X				
		Were method blanks taken through the	, ,	X				
		preparation and, if applicable, cleanup	procedures?					
		Were blank concentrations <mql?< td=""><td></td><td>X</td><td>Ш</td><td></td><td></td><td></td></mql?<>		X	Ш			
R6	OI	Laboratory control samples (LCS):						
		Were all COCs included in the LCS?		X				
		_	re analytical procedure, including prep and	X				
		cleanup steps?	0					
		Were LCSs analyzed at required frequ		X				
		Were LCS (and LCSD, if applicable) 9		X				
			data document the laboratory's capability to	X				5
		detect the COCs at the MDL used to c Was the LCSD RPD within QC limits?		-		Х		
R7	OI	Matrix spike (MS) and matrix spike				^		
107	<del>  0</del>	Were the project/method specified and		X		1	T	
		Were MS/MSD analyzed at the approp		X	H		-+	
		Were MS (and MSD, if applicable) %F	. ,	+^	Х		-+	4
		Were the MS/MSD RPDs within labora		X	$\vdash$		-+	
R8	OI	Analytical duplicate data						
	<del></del> -	Were appropriate analytical duplicates	s analyzed for each matrix?	X			T	
		Were analytical duplicates analyzed a	•	X			-	
		Were RPDs or relative standard devia		X				
R9	OI	Method quantitation limits (MQLs):	<b>/</b>					
			e included in the laboratory data package?	Х			T	
			entration of the lowest non-zero calibration	Х				
		Are unadjusted MQLs and DCSs inclu			Х			2
R10	OI	Other problems/anomalies						
		Are all known problems/anomalies/spe	ecial conditions noted in this LRC and ER?	Х				
		Was applicable and available technological	ogy used to lower the SDL to minimize the	Х				
			nder the Texas Laboratory Accreditation					
		Program for the analytes, matrices, an	d methods associated with this laboratory	X				3
		data package?	•					



Laboratory Name:		Accutest Gulf Coast LRC Date:				12/12/2012			
Project Na	me:	Quarterly Well Sampling, Parker Laboratory Project Number:		TC	TC20886				
Reviewer	Name:	Anita Patel Prep Batch Number(s):		GSS234, VK578					
#1	A ²	DESCRIPTION		YES	NO	NA3	NR⁴	ER#5	
S1	OI	Initial calibration (ICAL)							
		Were response factors and/or relative	e response factors for each analyte within QC	х					
		limits?		^					
		Were percent RSDs or correlation co	efficient criteria met?	Χ					
		Was the number of standards recommended in the method used for all analytes?							
			ne lowest and highest standard used to	l x l					
		calculate the curve?							
		Are ICAL data available for all instrum		Х					
			verified using an appropriate second source	l x l					
		standard?	10 11 (100)(11) 0010 1 11						
S2	OI		erification (ICCV AND CCV) and continuing						
		Was the CCV analyzed at the method	1 ,	X					
			alyte within the method-required QC limits?	X					
		Was the ICAL curve verified for each	,	Х					
			e concentration in the inorganic CCB <mdl?< th=""><th></th><th></th><th>Χ</th><th></th><th></th></mdl?<>			Χ			
S3	0	Mass spectral tuning	and a land for the control of	V I					
		Was the appropriate compound for th		X					
- 64		Were ion abundance data within the	method-required QC limits?	^	_				
S4	0	Internal standards (IS)	nes within the method-required QC limits?	ΧΙ					
S5	OI	Raw data (NELAC Section 5.5.10)	nes within the method-required QC limits?	^					
	<u> </u>		matograms, spectral data) reviewed by an						
		Were the raw data (for example, chromatograms, spectral data) reviewed by an							
		analyst? Were data associated with manual integrations flagged on the raw data?							
S6	0	Dual column confirmation							
	<b>├</b>	Did dual column confirmation results			Х				
S7	0	Tentatively identified compounds							
			s spectra and TIC data subject to appropriate		$\overline{}$				
		checks?				Х			
S8	ı	Interference Check Sample (ICS) r	esults						
		Were percent recoveries within method	od QC limits?			Х			
S9	ı	Serial dilutions, post digestion spi	kes, and method of standard additions						
		Were percent differences, recoveries	, and the linearity within the QC limits			Х			
		specified in the method?				^			
S10	OI	Method detection limit (MDL) studi							
		Was a MDL study performed for each		Х					
		Is the MDL either adjusted or support	ed by the analysis of DCSs?	Х				5	
S11	OI	Proficiency test reports							
		* .	ceptable on the applicable proficiency tests or	l x l					
		evaluation studies?							
S12	OI	Standards documentation	NIOT (		_				
		-	s NIST-traceable or obtained from other	Х					
S13	OI	appropriate source?  Compound/analyte identification p	recodures						
313	0	Are the procedures for compound/ana		Х					
S14	OI	Demonstration of analyst compete	,						
314	01	Was DOC conducted consistent with		X					
		Is documentation of the analyst's com	· · · · · · · · · · · · · · · · · · ·	X	$\dashv$				
S15	OI		ion for methods (NELAC Chapter 5)	^					
- 5.5	<del></del>		the data documentated, verified, and	ı					
		validated, where applicable?	and add additionated, voimou, and	X					
S16	OI	Laboratory standard operating pro	ocedures (SOPs)						
	j.,	Are laboratory SOPs current and on f		Х					
				٠.,					



	LABOR	RATORY REVIEW CHEC	KLIST (continued): Exception	n Reports	
Laboratory	Name:	Accutest Gulf Coast	LRC Date:	12/12/2012	
Project Na	me:	Quarterly Well Sampling, Parker	Laboratory Project Number:	TC20886	
Reviewer			Prep Batch Number(s):	GSS234, VK578	
ER# ¹	Description	on			
	For reporting	ng purposes, the MQL is defined in the	e report as the RL. The unadjusted MQL/RL is	reported in the method	
1	blank. The	SDL is defined in the report as the MI	DL.		
	For reporting	ng purposes, the method blank repres	ents the unadjusted MQL. The DCS is on file i	n the laboratory and is not	
2	included in	the laboratory data package.			
	The labora	tory is NELAC-accredited under the T	exas Laboratory Accreditation Program for the	analytes, matrices, and	
3	methods a	ssociated with this laboratory data pac	kage for analytes that are listed in the Texas F	ields of Accreditation.	
4	All anomal	ies are discussed in the case narrative	<b>9.</b>		
		, ,	or Method RSKSOP-147/175. The component	s reported are not listed or	
5	do not hav	e values in the Texas TRRP PCL table	es.		

1ER# = Exception Report identification number (an Exception Report should be completed for an item if "NR" or "No" is checked on





## GC/MS Volatiles

QC Data Summaries

Includes the following where applicable:

- Method Blank Summaries
- Blank Spike Summaries
- Matrix Spike and Duplicate Summaries



**Method:** SW846 8260B

# Method Blank Summary Job Number: TC20886

Job Number:

Account: PESTXST EarthCon Consultants

**Project:** Quarterly Well Sampling, Parker County, Texas

Sample VK578-MB	<b>File ID</b> K13177.D	<b>DF</b> 1	<b>Analyzed</b> 12/06/12	By EM	<b>Prep Date</b> n/a	<b>Prep Batch</b> n/a	<b>Analytical Batch</b> VK578

The QC reported here applies to the following samples:

CAS No.	Compound	Result	RL	MDL	Units Q
71-43-2	Benzene	ND	1.0	0.34	ug/l
100-41-4	Ethylbenzene	ND	1.0	0.32	ug/l
108-88-3	Toluene	ND	1.0	0.33	ug/l
1330-20-7	Xylene (total)	ND	3.0	0.87	ug/l

CAS No.	<b>Surrogate Recoveries</b>		Limits
1868-53-7	Dibromofluoromethane	107%	72-122%
17060-07-0	1,2-Dichloroethane-D4	105%	68-124%
2037-26-5	Toluene-D8	107%	80-119%
460-00-4	4-Bromofluorobenzene	103%	72-126%



**Method:** SW846 8260B

# Blank Spike Summary Job Number: TC20886

PESTXST EarthCon Consultants Account:

Quarterly Well Sampling, Parker County, Texas **Project:** 

Sample	<b>File ID</b>	<b>DF</b>	<b>Analyzed</b> 12/06/12	By	Prep Date	Prep Batch	Analytical Batch
VK578-BS	K13175.D	1		EM	n/a	n/a	VK578

The QC reported here applies to the following samples:

CAS No.	Compound	Spike ug/l	BSP ug/l	BSP %	Limits
71-43-2	Benzene	25	23.5	94	68-119
100-41-4	Ethylbenzene	25	23.4	94	71-117
108-88-3	Toluene	25	23.0	92	73-119
1330-20-7	Xylene (total)	75	71.7	96	74-119

CAS No.	<b>Surrogate Recoveries</b>	BSP	Limits
17060-07-0	Dibromofluoromethane	105%	72-122%
	1,2-Dichloroethane-D4	103%	68-124%
	Toluene-D8	105%	80-119%
	4-Bromofluorobenzene	101%	72-126%



^{* =} Outside of Control Limits.

# 6.3.1

Page 1 of 1

**Method:** SW846 8260B

## Matrix Spike/Matrix Spike Duplicate Summary

Job Number: TC20886

Account: PESTXST EarthCon Consultants

**Project:** Quarterly Well Sampling, Parker County, Texas

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	<b>Analytical Batch</b>
TC20506-1MS	K13179.D	1	12/06/12	EM	n/a	n/a	VK578
TC20506-1MSD	K13180.D	1	12/06/12	EM	n/a	n/a	VK578
TC20506-1	K13178.D	1	12/06/12	EM	n/a	n/a	VK578

The QC reported here applies to the following samples:

CAS No.	Compound	TC20506-1 ug/l Q	Spike ug/l	MS ug/l	MS %	MSD ug/l	MSD %	RPD	Limits Rec/RPD
71-43-2	Benzene	ND	25	23.4	94	23.1	92	1	68-119/12
100-41-4	Ethylbenzene	ND	25	22.9	92	22.6	90	1	71-117/12
108-88-3	Toluene	ND	25	23.0	92	22.1	88	4	73-119/13
1330-20-7	Xylene (total)	ND	75	71.6	95	69.3	92	3	74-119/13

CAS No.	<b>Surrogate Recoveries</b>	MS	MSD	TC20506-1	Limits
1868-53-7	Dibromofluoromethane	108%	108%	105%	72-122%
17060-07-0	1,2-Dichloroethane-D4	103%	105%	104%	68-124%
2037-26-5	Toluene-D8	107%	105%	106%	80-119%
460-00-4	4-Bromofluorobenzene	103%	104%	104%	72-126%



^{* =} Outside of Control Limits.



## GC Volatiles

## QC Data Summaries

### Includes the following where applicable:

- Method Blank Summaries
- Blank Spike Summaries
- Matrix Spike and Duplicate Summaries



Method: RSKSOP-147/175

# Method Blank Summary Job Number: TC20886

Account: PESTXST EarthCon Consultants

Quarterly Well Sampling, Parker County, Texas **Project:** 

Sample GSS234-MB	File ID SS005099.D	<b>DF</b> 1	<b>Analyzed</b> 12/10/12	By LT	<b>Prep Date</b> n/a	<b>Prep Batch</b> n/a	Analytical Batch GSS234

The QC reported here applies to the following samples:

CAS No.	Compound	Result	RL	MDL	Units Q
74-82-8	Methane	ND	0.50	0.30	ug/l
74-85-1	Ethene	ND	1.0	0.50	ug/l
74-84-0	Ethane	ND	1.0	0.50	ug/l
74-98-6	Propane	ND	1.5	0.75	ug/l
75-28-5	Isobutane	ND	1.5	0.75	ug/l
106-97-8	Butane	ND	1.5	0.75	ug/l



Method: RSKSOP-147/175

# Blank Spike Summary Job Number: TC20886

Account: PESTXST EarthCon Consultants

Quarterly Well Sampling, Parker County, Texas **Project:** 

Sample GSS234-BS	File ID SS005096.D	<b>DF</b> 1	<b>Analyzed</b> 12/10/12	By LT	Prep Date n/a	Prep Batch n/a	Analytical Batch GSS234

The QC reported here applies to the following samples:

CAS No.	Compound	Spike ug/l	BSP ug/l	BSP %	Limits
74-82-8	Methane	21.5	20.9	97	68-139
74-85-1	Ethene	57.4	43.4	76	52-145
74-84-0	Ethane	43.3	49.3	114	68-131
74-98-6	Propane	60.6	59.3	98	69-131
75-28-5	Isobutane	72.5	69.9	96	72-131
106-97-8	Butane	76.6	73.6	96	66-128



^{* =} Outside of Control Limits.

Method: RSKSOP-147/175

# Matrix Spike Summary Job Number: TC20886

Account: PESTXST EarthCon Consultants

**Project:** Quarterly Well Sampling, Parker County, Texas

Sample TC21021-2MS TC21021-2	File ID SS005113.D SS005112.D	<b>Analyzed</b> 12/10/12 12/10/12	By LT LT	Prep Date n/a n/a	Prep Batch n/a n/a	Analytical Batch GSS234 GSS234

The QC reported here applies to the following samples:

CAS No.	Compound	TC21021-2 ug/l Q	Spike ug/l	MS ug/l	MS %	Limits
74-82-8	Methane	1.49	21.5	24.3	106	68-139
74-85-1	Ethene	ND	57.4	55.4	97	52-145
74-84-0	Ethane	ND	43.3	64.1	148*	68-131
74-98-6	Propane	ND	60.6	75.7	125	69-131
75-28-5	Isobutane	ND	72.5	87.2	120	72-131
106-97-8	Butane	ND	76.6	93.9	123	66-128



^{* =} Outside of Control Limits.

Method: RSKSOP-147/175

# **Duplicate Summary Job Number:** TC20886

**Account:** PESTXST EarthCon Consultants

**Project:** Quarterly Well Sampling, Parker County, Texas

Sample TC21021-1DUP TC21021-1	File ID SS005111.D SS005110.D	<b>Analyzed</b> 12/10/12 12/10/12	By LT LT	Prep Date n/a n/a	Prep Batch n/a n/a	Analytical Batch GSS234 GSS234

The QC reported here applies to the following samples:

CAS No.	Compound	TC21021-1 ug/l Q	DUP ug/l Q	RPD	Limits
74-82-8	Methane	0.88	0.86	2	53
74-85-1	Ethene	ND	ND	nc	27
74-84-0	Ethane	ND	ND	nc	43
74-98-6	Propane	ND	ND	nc	21
75-28-5	Isobutane	ND	ND	nc	35
106-97-8	Butane	ND	ND	nc	33



^{* =} Outside of Control Limits.



#### ANALYSIS REPORT

Lab #: 321090 Job #: 20030

Sample Name/Number: WW13-Str-120212 Company: Oil Tracers, LLC

Date Sampled: 12/02/2012

Container: Dissolved Gas Bottle

Field/Site Name: Third Quarter Well Sampling

Location: Parker County, Texas

Formation/Depth:

Sampling Point:

Date Received: 12/05/2012 Date Reported: 2/01/2013

Component	Chemical	$\delta^{13}C$	$\delta D$	$\delta^{18} O$
Component	mol. %	%。	%。	%。
Carbon Monoxide	nd			
Hydrogen Sulfide	na			
Helium	na			
Hydrogen	nd			
Argon	1.05			
Oxygen	0.089			
Nitrogen	57.10			
Carbon Dioxide	0.30			
Methane	39.39	-46.16	-181.3	
Ethane	2.07	-31.8		
Ethylene	nd			
Propane	0.0006			
Propylene	nd			
Iso-butane	nd			
N-butane	0.0006			
Iso-pentane	nd			
N-pentane	nd			
Hexanes +	0.0006			

#### Remarks:

Analysis is of gas extracted from water by headspace equilibration. Analysis has been corrected for helium added to create headspace. Helium dilution factor = 0.67

nd = not detected. na = not analyzed. Isotopic composition of hydrogen is relative to VSMOW. Isotopic composition of carbon is relative to VPDB. Isotopic composition of oxygen is relative to VSMOW, except for carbon dioxide which is relative to VPDB. Calculations for BTU and specific gravity per ASTM D3588. Chemical compositions are normalized to 100%. Mol. % is approximately equal to vol. %.

^{*}Addition of helium negates the ability to detect native helium and may negate the ability to detect hydrogen.

^{**} Ethane isotopes obtained online via GC-C-IRMS



12/12/12



## Technical Report for

EarthCon Consultants

Quarterly Well Sampling, Parker County, Texas

3rd Quarter / WW18-Str

Accutest Job Number: TC20885

Sampling Date: 12/02/12

### Report to:

EarthCon Consultants 4800 Sugar Grove Suite 420 Stafford, TX 77477

gfloreslovo@earthcon.com; djackson@jacksonsjoberg.com; mcpatton@rangeresources.com; escott@earthcon.com

ATTN: Gabriela Floreslovo

Total number of pages in report: 30



Test results contained within this data package meet the requirements of the National Environmental Laboratory Accreditation Conference and/or state specific certification programs as applicable.

Richard Rollriguez Laboratory Director

Client Service contact: Elessa Sommers 713-271-4700

Certifications: TX (T104704220-12-8) AR (11-028-0) AZ (AZ0769) FL (E87628) KS (E-10366) LA (85695/04004) OK (211-035)

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# **Sample Summary**

EarthCon Consultants

Job No:

TC20885

Quarterly Well Sampling, Parker County, Texas Project No: 3rd Quarter / WW18-Str

Sample Number	Collected Date		Received	Matr Code		Client Sample ID
TC20885-1	12/02/12	11:50	12/04/12	AQ	Ground Water	WW18-STR-120212





#### SAMPLE DELIVERY GROUP CASE NARRATIVE

Client: EarthCon Consultants Job No TC20885

Site: Quarterly Well Sampling, Parker County, Texas Report Date 12/12/2012 1:52:04 PM

1 Sample was collected on 12/02/2012 and received intact at Accutest on 12/04/2012 and properly preserved in 1 cooler at 2.4 Deg C. The sample received an Accutest job number of TC20885. A listing of the Laboratory Sample ID, Client Sample ID and date of collection are presented in the Results Summary Section of this report.

Except as noted below, all method specified calibrations and quality control performance criteria were met for this job. For more information, please refer to QC summary pages.

#### Volatiles by GCMS By Method SW846 8260B

Matrix AO Batch ID: VK578

- All samples were analyzed within the recommended method holding time.
- All method blanks for this batch meet method specific criteria.
- Sample(s) TC20506-1MS, TC20506-1MSD were used as the QC samples indicated.

#### Volatiles by GC By Method RSKSOP-147/175

Matrix AQ Batch ID: GSS233

- All samples were analyzed within the recommended method holding time.
- All method blanks for this batch meet method specific criteria.
- Sample(s) TC20879-1DUP, TC20970-2MS were used as the QC samples indicated.
- TC20970-2MS: Sample was not preserved to a pH < 2.

Matrix AQ Batch ID: GSS234

- All samples were analyzed within the recommended method holding time.
- All method blanks for this batch meet method specific criteria.
- Sample(s) TC21021-1DUP, TC21021-2MS were used as the QC samples indicated.

Accutest Laboratories Gulf Coast (ALGC) certifies that this report meets the project requirements for analytical data produced for the samples as received at ALGC and as stated on the COC. ALGC certifies that the data meets the Data QualityObjectives for precision, accuracy and completeness as specified in the ALGC Quality Manual except as noted above. This report is to be used in its entirety. ALGC is not responsible for any assumptions of data quality if partial data packages are used

**Summary of Hits Job Number:** TC20885

Account: EarthCon Consultants

Quarterly Well Sampling, Parker County, Texas 12/02/12**Project:** 

Collected:

Lab Sample ID Analyte	Client Sample ID	Result/ Qual	MQL	SDL	Units	Method
TC20885-1	WW18-STR-1202	12				
Methane Ethane		1.26 0.0921	0.010 0.0010	0.0060 0.00050	mg/l mg/l	RSKSOP-147/175 RSKSOP-147/175



Sample Results	
Report of Analysis	



### 4

## **Report of Analysis**

Client Sample ID: WW18-STR-120212

 Lab Sample ID:
 TC20885-1
 Date Sampled:
 12/02/12

 Matrix:
 AQ - Ground Water
 Date Received:
 12/04/12

 Method:
 SW846 8260B
 Percent Solids:
 n/a

**Project:** Quarterly Well Sampling, Parker County, Texas

	File ID	DF	Analyzed	$\mathbf{B}\mathbf{y}$	<b>Prep Date</b>	<b>Prep Batch</b>	<b>Analytical Batch</b>	
Run #1	K13198.D	1	12/06/12	EM	n/a	n/a	VK578	
Run #2								

	Purge Volume	
Run #1	5.0 ml	
Run #2		

#### **Purgeable Aromatics**

CAS No.	Compound	Result	MQL	SDL	Units	Q
71-43-2 108-88-3 100-41-4 1330-20-7	Benzene Toluene Ethylbenzene Xylene (total)	0.00034 U 0.00033 U 0.00032 U 0.00087 U	0.0010 0.0010 0.0010 0.0030	0.00034 0.00033 0.00032 0.00087	mg/l mg/l mg/l mg/l	
CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits		
1868-53-7 17060-07-0 2037-26-5 460-00-4	Dibromofluoromethane 1,2-Dichloroethane-D4 Toluene-D8 4-Bromofluorobenzene	106% 106% 105% 104%		72-122% 68-124% 80-119% 72-126%		

 $\begin{array}{ll} U = & Not \; detected & SDL \; - \; Sample \; Detection \; Limit \\ MQL = & Method \; Quantitation \; Limit \\ \end{array}$ 

E = Indicates value exceeds calibration range

J = Indicates an estimated value

B = Indicates analyte found in associated method blank N = Indicates presumptive evidence of a compound



## **Report of Analysis**

Client Sample ID: WW18-STR-120212

 Lab Sample ID:
 TC20885-1
 Date Sampled:
 12/02/12

 Matrix:
 AQ - Ground Water
 Date Received:
 12/04/12

 Method:
 RSKSOP-147/175
 Percent Solids:
 n/a

**Project:** Quarterly Well Sampling, Parker County, Texas

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	SS005077.D	1	12/07/12	LT	n/a	n/a	GSS233
Run #2	SS005101.D	20	12/10/12	LT	n/a	n/a	GSS234

#### **RSK147 Special List**

Compound	Result	MQL	SDL	Units	Q
Methane	1.26 a	0.010	0.0060	mg/l	
Ethene	0.00050 U	0.0010	0.00050	mg/l	
Ethane	0.0921	0.0010	0.00050	mg/l	
Propane	0.00075 U	0.0015	0.00075	mg/l	
sobutane	0.00075 U	0.0015	0.00075	mg/l	
Butane	0.00075 U	0.0015	0.00075	mg/l	
	Compound  Methane Ethene Ethane Propane sobutane Butane	Methane       1.26 a         Ethene       0.00050 U         Ethane       0.0921         Propane       0.00075 U         sobutane       0.00075 U	Methane 1.26 a 0.010 Ethene 0.00050 U 0.0010 Ethane 0.0921 0.0010 Propane 0.00075 U 0.0015	Methane         1.26 a         0.010         0.0060           Ethene         0.00050 U         0.0010         0.00050           Ethane         0.0921         0.0010         0.00050           Propane         0.00075 U         0.0015         0.00075           sobutane         0.00075 U         0.0015         0.00075	Methane         1.26 a         0.010         0.0060 mg/l           Ethene         0.00050 U         0.0010         0.00050 mg/l           Ethane         0.0921         0.0010         0.00050 mg/l           Propane         0.00075 U         0.0015         0.00075 mg/l           sobutane         0.00075 U         0.0015         0.00075 mg/l

(a) Result is from Run# 2

U = Not detected

SDL - Sample Detection Limit

MQL = Method Quantitation Limit

E = Indicates value exceeds calibration range

J = Indicates an estimated value

B = Indicates analyte found in associated method blank N = Indicates presumptive evidence of a compound





Misc. Forms

Custody Documents and Other Forms

Includes the following where applicable:

- Chain of Custody
- LRC Form



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Relinguished by Sampler: Date Time	7.4-1337	Received By:					_	Reli	nouisti	ed By							Date T	ime:		Recei	ved By:				
Relinquished by Sampler: Date Time		3						ستمر	$\overline{}$											4					
Relinquished by: Date Time		Received By:					Z	Cur	tody S	eal#				Intact		Preser	ved whe	re applic	able			On le		Cook	r Temp.
5		5											Ц	Not int	act										

TC20885: Chain of Custody Page 1 of 4







### **Accutest Laboratories Sample Receipt Summary**

Accutest Job Number: TC20885	Client: E	EARTHCON CONSULTANT	S Pro	oject: 3RD QTR WEI	LL SAMPLING	,PARKE	R COUNTY,T				
Date / Time Received: 12/4/2012	I	Delivery Method:	Client Airb	ill #'s:							
No. Coolers:1 Therm ID:	IR6		Temp	Adjustment Factor:	0.2						
Cooler Temps (Initial/Adjusted): #1: (2.2/2.4)											
Cooler Security Y or N		Y or N	Sample Integrity - Do	ocumentation	<u>Y o</u>	<u>r N</u>					
<ol> <li>Custody Seals Present: ✓</li> <li>Custody Seals Intact: ✓</li> <li>4.</li> </ol>	<ol><li>COC Pre Smpl Dates/</li></ol>		Sample labels prese     Container labeling co		<b>✓</b>						
Cooler Temperature Y or N	<u>L</u>		Sample container lab	•	✓						
<ol> <li>Temp criteria achieved:</li> <li>Cooler temp verification:</li> </ol> Infared G			Sample Integrity - C  1. Sample recvd within		<u>Y o</u>	<u>r N</u>					
3. Cooler media: Ice (bac Quality Control Preservation Y or I		WTB STB	All containers account     Condition of sample:	ited for:	<b>✓</b> Int	□ act					
1. Trip Blank present / cooler:			Sample Integrity - In	structions	<u>Y o</u>	r N	N/A				
2. Trip Blank listed on COC:			1. Analysis requested	s clear:	<b>✓</b>						
3. Samples preserved properly:			2. Bottles received for	unspecified tests		✓					
4. VOCs headspace free: ✓			3. Sufficient volume re	,	<b>✓</b>						
			Compositing instruc				$\checkmark$				
			5. Filtering instructions	clear:			✓				
Comments -Received tripblank not listed on C	OC.										

TC20885: Chain of Custody Page 2 of 4

Page 1 of 3







#### **Problem Resolution**

Accutest Job Number: TC20885

CSR: Elessa Sommers Response Date: 12/5/2012

Response: Trip blank is on separate report.

TC20885: Chain of Custody Page 3 of 4





### Sample Receipt Log

 Job #:
 TC20885
 Date / Time Received:
 12/4/2012 9:22:00 AM
 Initials:
 CH

Client: EARTHCON CONSULTANTS

Cooler #	Sample ID:	Vol	Bot #	Location	Pres	рН	Therm ID	Initial Temp	Therm CF	Corrected Temp
1	TC20885-1	40ml	1	VR	HCL	Note #1 - Preservative to be checked by analyst at the instrument.	IR6	2.2	0.2	2.4
1	TC20885-1	40ml	2	VR	HCL	Note #1 - Preservative to be checked by analyst at the instrument.	IR6	2.2	0.2	2.4
1	TC20885-1	40ml	3	VR	HCL	Note #1 - Preservative to be checked by analyst at the instrument.	IR6	2.2	0.2	2.4
1	TC20885-1	40ml	4	VR	HCL	Note #1 - Preservative to be checked by analyst at the instrument.	IR6	2.2	0.2	2.4
1	TC20885-1	40ml	5	VR	HCL	Note #1 - Preservative to be checked by analyst at the instrument.	IR6	2.2	0.2	2.4
1	TC20885-1	40ml	6	VR	HCL	Note #1 - Preservative to be checked by analyst at the instrument.	IR6	2.2	0.2	2.4

TC20885: Chain of Custody

Page 4 of 4



#### Laboratory Data Package Cover Page Appendix A

This signature page, the laboratory review checklist, and the following reportable data:

TC20885 This data package consists of

**QA Manager** Name (Printed)

Richard Rodriguez

Signature

ė	R1	Field chain-of-custody documentation	n;
	R2	Sample identification cross-reference	e;
	R3	Test reports (analytical data sheets)	for each environmental sample that includes:
		a)	Items consistent with NELAC 5.13 or ISO/IEC 17025 Section 5.10
		b)	dilution factors,
		c)	preparation methods,
		d)	cleanup methods, and
		e)	if required for the project, tentatively identified compounds (TICs).
	R4	Surrogate recovery data including:	
		a)	Calculated recovery (%R), and
		b)	The laboratory's surrogate QC limits.
	R5	Test reports/summary forms for blan	k samples;
	R6	Test reports/summary forms for labor	ratory control samples (LCSs) including:
		a)	LCS spiking amounts,
		b)	Calculated %R for each analyte, and
		c)	The laboratory's LCS QC limits.
	R7	Test reports for project matrix spike/r	matrix spike duplicates (MS/MSDs) including:
		a)	Samples associated with the MS/MSD clearly identified,
		b)	MS/MSD spiking amounts,
		c)	Concentration of each MS/MSD analyte measured in the parent and
		d)	Calculated %Rs and relative percent differences (RPDs), and
		e)	The laboratory's MS/MSD QC limits
	R8	Laboratory analytical duplicate (if app	plicable) recovery and precision:
		a)	The amount of analyte measured in the duplicate,
		b)	The calculated RPD, and
		c)	The laboratory's QC limits for analytical duplicates.
	R9	List of method quantitation limits (MC	QLs) and detectability check sample results for each analyte for each
	R10	Other problems or anomalies.	
		, ,	item in Laboratory Review Checklist and for each analyte, matrix, and
method for	which the I	aboratory does not hold NELAC accre	editation under the Texas Laboratory Accreditation Program.
Release S	tatement:	I am responsible for the release of this	s laboratory data package. This laboratory is NELAC accredited under the
Texas Lab	oratory Acc	reditation Program for all the methods	, analytes, and matrices reported in this data package except as noted in
the Except	ion Report.	This data package has been reviewed	d by the laboratory and is complete and technically compliant with the
requiremen	nts of the m	ethods used, except where noted by the	he laboratory in the attached exception reports. By my signature below, I
affirm to th	e best of my	y knowledge, all problems/anomalies,	observed by the laboratory as having the potential to affect the quality of
the data, h	ave been id	entified by the laboratory in the Labor	atory Review Checklist, and no information or data have been knowingly
withheld.			
	applicable:	This laboratory meets an exception u	under 30 TAC&25.6 and was last inspection by
[]		[X ] TCEQ or [ ] on April 2	011. Any findings affecting the data in this laboratory data package are
		noted in the Exception Reports herei	n. The official signing the cover page of the report in which these data are
		used is responsible for releasing this	data package and is by signature affirming the above release statement

Official Title (printed)

Laboratory Director

Date

12/12/2012



Laborat	N1		HECKLIST: REPORTABLE			046		
Laboratory	Name:	Accutest Gulf Coast	LRC Date:	12/	12/2	012		
5		Quarterly Well Sampling, Parker	Laborator Budad North					
Project Na		County, Texas	Laboratory Project Number:	_	2088			
Reviewer #1		Anita Patel	Prep Batch Number(s):	GSS				IED 45
# R1	A ²	DESCRIPTION  CHAIN-OF-CUSTODY (C-O-C):	YES	NO	INA	INK	ER#	
N I	01	Did samples meet the laboratory's standard conditions of sample acceptability				ı	ı	
		upon receipt?	andard conditions of sample acceptability	X				
			anditions described in an exception report?	X				
R2	OI	Sample and quality control (QC) ide		+^				
I\Z	- 01		referenced to the laboratory ID numbers?	Х	1	ı	ı	
		<u> </u>		_				<u> </u>
		·	eferenced to the corresponding QC data?	X				
R3	OI	Test reports  Were samples prepared and analyzed within holding times?						
				X			-	-
			all other raw values bracketed by calibration	Х				
		standards?	or oupon door?					
		Were calculations checked by a peer		X				
		Were all analyte identifications check	X				-	
		Were sample detection limits reported for all analytes not detected?  Were all results for soil and sediment samples reported on a dry weight basis?				V	-	<u> </u>
		Were % moisture (or solids) reported				X		
			latile analysis extracted with methanol per	-		_ ^		-
		SW846 Method 5035?	name analysis extracted with methanol per			Х		
		If required for the project, are TIC's re	ported?			Х		<b>†</b>
R4	0	Surrogate recovery data	portou.					
	_ <u> </u>	Were surrogates added prior to extract	ction?	Х		I	Ī	
			all samples within the laboratory QC limits?	X				
R5	OI	Test reports/summary forms for bl	<u> </u>					
	<u> </u>	Were appropriate type(s) of blanks ar		Х				
		Were blanks analyzed at the appropri	•	X				
V	Were method blanks taken through th		X					
	preparation and, if applicable, cleanup procedures?							
		Were blank concentrations <mql?< td=""><td></td><td></td><td></td></mql?<>						
R6	OI	Laboratory control samples (LCS):						
		Were all COCs included in the LCS?						
		Was each LCS taken through the ent	ire analytical procedure, including prep and					
		cleanup steps?		X				
		Were LCSs analyzed at required freq	uency?	Х				
		Were LCS (and LCSD, if applicable)	%Rs within the laboratory QC limits?	Х				
		Does the detectablility check sample	data document the laboratory's capability to	Х				4
		detect the COCs at the MDL used to	calculate the SDLs?	^				4
		Was the LCSD RPD within QC limits	?			Х		
R7	OI	Matrix spike (MS) and matrix spike						
		Were the project/method specified an		Х				
		Were MS/MSD analyzed at the appro		Х				
		Were MS (and MSD, if applicable) %		Х				
		Were the MS/MSD RPDs within labor	ratory QC limits?	Х				
R8	OI	Analytical duplicate data						
		Were appropriate analytical duplicate	s analyzed for each matrix?	Х				
		Were analytical duplicates analyzed a		Х				
		Were RPDs or relative standard devia	ations within the laboratory QC limits?	Х				
R9	OI	Method quantitation limits (MQLs):						
			e included in the laboratory data package?	X				
			entration of the lowest non-zero calibration	Х				
		· · · · · · · · · · · · · · · · · · ·	uded in the laboratory data package?		Χ			2
R10	OI	Other problems/anomalies						
			ecial conditions noted in this LRC and ER?	Х				
			logy used to lower the SDL to minimize the	Х				
		1	nder the Texas Laboratory Accreditation					
			nd methods associated with this laboratory	X				3
	data package?		1	1	1	1	1	



Laboratory	Name:	Accutest Gulf Coast	LRC Date:	12/	12/2	012		
Project Na		Quarterly Well Sampling, Parker		TC20885				
Reviewer	Name:	Anita Patel	Prep Batch Number(s):	GSS2			78	
#1	A ²	DESCRIPTION	1 10p 2aton (1am201(0))	YES				FR#
S1	OI	Initial calibration (ICAL)		120		,		
	<u> </u>		response factors for each analyte within QC	x				
		limits?						
		Were percent RSDs or correlation co	efficient criteria met?	Х				
			mended in the method used for all analytes?	X				
			e lowest and highest standard used to		_			
		calculate the curve?	o tomoot and mgrioot otaliaala acca to	X				
		Are ICAL data available for all instrum	nents used?	X				
			verified using an appropriate second source					
		standard?	vernice using an appropriate second source	X				
S2	OI		erification (ICCV AND CCV) and continuing					
		Was the CCV analyzed at the method		Х				
			alyte within the method-required QC limits?	X				
		Was the ICAL curve verified for each	·	X			М	
			concentration in the inorganic CCB <mdl?< td=""><td>  '  </td><td></td><td>Х</td><td></td><td></td></mdl?<>	'		Х		
S3	0	Mass spectral tuning				Ť.		
		Was the appropriate compound for th	e method used for tuning?	Х				
		Were ion abundance data within the		X				
S4	0	Internal standards (IS)	nomica required de imme.	<i>~</i>				
	_ <u> </u>	` '	nes within the method-required QC limits?	Х				
S5	OI	Raw data (NELAC Section 5.5.10)	iso maini ais mealea requirea qui illino.					
	<u> </u>		matograms, spectral data) reviewed by an					
		analyst?	mategrame, opeonal data/ reviewed by all	X				
		Were data associated with manual in	tegrations flagged on the raw data?	Х				
S6	0	Dual column confirmation	~					
		Did dual column confirmation results	meet the method-required QC?			Х		
S7	0	Tentatively identified compounds (TICs):						
			s spectra and TIC data subject to appropriate					
		checks?				Χ		
S8		Interference Check Sample (ICS) re	esults					
		Were percent recoveries within method				Х		
S9		-	kes, and method of standard additions					
		Were percent differences, recoveries,						
		specified in the method?	•			Χ		
S10	OI	Method detection limit (MDL) studi	es					
		Was a MDL study performed for each	reported analyte?	Х				
		Is the MDL either adjusted or support		Х				4
S11	OI	Proficiency test reports	·					
			ceptable on the applicable proficiency tests or	V				
		evaluation studies?		X				
S12	OI	Standards documentation						
		Are all standards used in the analyses	s NIST-traceable or obtained from other	,, I				
		appropriate source?		X				
S13	OI	Compound/analyte identification p	rocedures					
		Are the procedures for compound/ana		Х				
S14	OI	Demonstration of analyst compete						
		Was DOC conducted consistent with		Х				
		Is documentation of the analyst's com	·	Х				
S15	OI		ion for methods (NELAC Chapter 5)					
			the data documentated, verified, and	, I				
		validated, where applicable?		X				
S16	OI	Laboratory standard operating pro	cedures (SOPs)					
		Are laboratory SOPs current and on fi		Х				



	LABOR	RATORY REVIEW CHEC	KLIST (continued): Exception	n Reports					
Laboratory	Name:	Accutest Gulf Coast	LRC Date:	12/12/2012					
Project Na	me:	Quarterly Well Sampling, Parker	Laboratory Project Number:	TC20885					
Reviewer	Name:	Anita Patel	Prep Batch Number(s):	GSS233, VK578					
ER# ¹	Description	n							
1	blank. The	SDL is defined in the report as the MI		'					
2	For reporting purposes, the method blank represents the unadjusted MQL. The DCS is on file in the laboratory and is not included in the laboratory data package.								
3			exas Laboratory Accreditation Program for the kage for analytes that are listed in the Texas F						
4		tory does not perform DCS analysis for evalues in the Texas TRRP PCL table	or Method RSKSOP-147/175. The component es.	s reported are not listed or					
-									

1ER# = Exception Report identification number (an Exception Report should be completed for an item if "NR" or "No" is checked on



## GC/MS Volatiles

QC Data Summaries

Includes the following where applicable:

- Method Blank Summaries
- Blank Spike Summaries
- Matrix Spike and Duplicate Summaries



**Method:** SW846 8260B

# Method Blank Summary Job Number: TC20885

Job Number:

PESTXST EarthCon Consultants Account:

**Project:** Quarterly Well Sampling, Parker County, Texas

Sample VK578-MB	<b>File ID</b> K13177.D	<b>DF</b> 1	<b>Analyzed</b> 12/06/12	By EM	Prep Date n/a	Prep Batch n/a	Analytical Batch VK578

### The QC reported here applies to the following samples:

TC20885-1

CAS No.	Compound	Result	RL	MDL	Units Q
71-43-2	Benzene	ND	1.0	0.34	ug/l
100-41-4	Ethylbenzene	ND	1.0	0.32	ug/l
108-88-3	Toluene	ND	1.0	0.33	ug/l
1330-20-7	Xylene (total)	ND	3.0	0.87	ug/l

CAS No.	<b>Surrogate Recoveries</b>		Limits
1868-53-7	Dibromofluoromethane	107%	72-122%
17060-07-0	1,2-Dichloroethane-D4	105%	68-124%
2037-26-5	Toluene-D8	107%	80-119%
460-00-4	4-Bromofluorobenzene	103%	72-126%



**Method:** SW846 8260B

# Blank Spike Summary Job Number: TC20885

PESTXST EarthCon Consultants Account:

Quarterly Well Sampling, Parker County, Texas **Project:** 

Sample VK578-BS	<b>File ID</b> K13175.D	<b>DF</b> 1	<b>Analyzed</b> 12/06/12	By EM	<b>Prep Date</b> n/a	Prep Batch n/a	Analytical Batch VK578

The QC reported here applies to the following samples:

TC20885-1

CAS No.	Compound	Spike ug/l	BSP ug/l	BSP %	Limits
71-43-2	Benzene	25	23.5	94	68-119
100-41-4	Ethylbenzene	25	23.4	94	71-117
108-88-3	Toluene	25	23.0	92	73-119
1330-20-7	Xylene (total)	75	71.7	96	74-119

CAS No.	<b>Surrogate Recoveries</b>	BSP	Limits
1868-53-7	Dibromofluoromethane	105%	72-122%
17060-07-0	1,2-Dichloroethane-D4	103%	68-124%
2037-26-5	Toluene-D8	105%	80-119%
460-00-4	4-Bromofluorobenzene	101%	72-126%



^{* =} Outside of Control Limits.

**Method:** SW846 8260B

# Matrix Spike/Matrix Spike Duplicate Summary Job Number: TC20885

Account: PESTXST EarthCon Consultants

**Project:** Quarterly Well Sampling, Parker County, Texas

TC20506-1MS K13179.D 1 12/06/12 EM n/a n/a VK578 TC20506-1MSD K13180.D 1 12/06/12 EM n/a n/a VK578 TC20506-1 K13178.D 1 12/06/12 EM n/a n/a VK578	TC20506-1MSD	K13180.D	<b>DF</b> 1 1 1	12/06/12	EM	n/a	n/a	VK578
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The QC reported here applies to the following samples:

TC20885-1

CAS No.	Compound	TC20506-1 ug/l Q	Spike ug/l	MS ug/l	MS %	MSD ug/l	MSD %	RPD	Limits Rec/RPD
71-43-2	Benzene	ND	25	23.4	94	23.1	92	1	68-119/12
100-41-4	Ethylbenzene	ND	25	22.9	92	22.6	90	1	71-117/12
108-88-3	Toluene	ND	25	23.0	92	22.1	88	4	73-119/13
1330-20-7	Xylene (total)	ND	75	71.6	95	69.3	92	3	74-119/13

CAS No.	<b>Surrogate Recoveries</b>	MS	MSD	TC20506-1	Limits
1868-53-7	Dibromofluoromethane	108%	108%	105%	72-122%
17060-07-0	1,2-Dichloroethane-D4	103%	105%	104%	68-124%
2037-26-5	Toluene-D8	107%	105%	106%	80-119%
460-00-4	4-Bromofluorobenzene	103%	104%	104%	72-126%

^{* =} Outside of Control Limits.



## GC Volatiles

# QC Data Summaries

### Includes the following where applicable:

- Method Blank Summaries
- Blank Spike Summaries
- Matrix Spike and Duplicate Summaries



Method: RSKSOP-147/175

# Method Blank Summary Job Number: TC20885

Account: PESTXST EarthCon Consultants

Quarterly Well Sampling, Parker County, Texas **Project:** 

Sample GSS233-MB	File ID SS005056.D	<b>DF</b> 1	<b>Analyzed</b> 12/07/12	By LT	<b>Prep Date</b> n/a	<b>Prep Batch</b> n/a	Analytical Batch GSS233

The QC reported here applies to the following samples:

CAS No.	Compound	Result	RL	MDL	Units Q
74-85-1	Ethene	ND	1.0	0.50	ug/l
74-84-0	Ethane	ND	1.0	0.50	ug/l
74-98-6	Propane	ND	1.5	0.75	ug/l
75-28-5	Isobutane	ND	1.5	0.75	ug/l
106-97-8	Butane	ND	1.5	0.75	ug/l



# Method Blank Summary Job Number: TC20885

Account: PESTXST EarthCon Consultants

Quarterly Well Sampling, Parker County, Texas **Project:** 

Sample GSS234-MB	File ID SS005099.D	<b>DF</b> 1	<b>Analyzed</b> 12/10/12	By LT	<b>Prep Date</b> n/a	<b>Prep Batch</b> n/a	Analytical Batch GSS234

The QC reported here applies to the following samples: Method: RSKSOP-147/175

CAS No.	Compound	Result	RL	MDL	Units Q
74-82-8	Methane	ND	0.50	0.30	ug/l



Method: RSKSOP-147/175

# Blank Spike Summary Job Number: TC20885

PESTXST EarthCon Consultants Account:

Quarterly Well Sampling, Parker County, Texas **Project:** 

Sample GSS233-BS	File ID SS005054.D	<b>DF</b> 1	<b>Analyzed</b> 12/07/12	By LT	Prep Date n/a	Prep Batch n/a	Analytical Batch GSS233

The QC reported here applies to the following samples:

CAS No.	Compound	Spike ug/l	BSP ug/l	BSP %	Limits
74-85-1	Ethene	57.4	43.2	75	52-145
74-84-0	Ethane	43.3	47.1	109	68-131
74-98-6	Propane	60.6	60.5	100	69-131
75-28-5	Isobutane	72.5	70.4	97	72-131
106-97-8	Butane	76.6	73.6	96	66-128



^{* =} Outside of Control Limits.

# Blank Spike Summary Job Number: TC20885

Account: PESTXST EarthCon Consultants

Quarterly Well Sampling, Parker County, Texas **Project:** 

	Sample GSS234-BS	<b>File ID</b> SS005096.D	<b>DF</b> 1	<b>Analyzed</b> 12/10/12	By LT	<b>Prep Date</b> n/a	Prep Batch n/a	Analytical Batch GSS234
--	---------------------	------------------------------	-------------	--------------------------	----------	----------------------	-------------------	----------------------------

The QC reported here applies to the following samples: Method: RSKSOP-147/175

CAS No.	Compound	Spike ug/l	BSP ug/l	BSP %	Limits
74-82-8	Methane	21.5	20.9	97	68-139



^{* =} Outside of Control Limits.

Method: RSKSOP-147/175

# Matrix Spike Summary Job Number: TC20885

PESTXST EarthCon Consultants Account:

Quarterly Well Sampling, Parker County, Texas **Project:** 

Sample TC20970-2MS ^a TC20970-2 ^a	File ID SS005067.D SS005066.D	Analyzed 12/07/12 12/07/12	By LT LT	Prep Date n/a n/a	Prep Batch n/a n/a	Analytical Batch GSS233 GSS233

The QC reported here applies to the following samples:

TC20885-1

CAS No.	Compound	TC20970-2 ug/l Q	Spike ug/l	MS ug/l	MS %	Limits
74-85-1	Ethene	ND	57.4	46.6	81	52-145
74-84-0	Ethane	4.71	43.3	46.7	97	68-131
74-98-6	Propane	ND	60.6	53.4	88	69-131
75-28-5	Isobutane	ND	72.5	61.8	85	72-131
106-97-8	Butane	ND	76.6	66.0	86	66-128

(a) Sample was not preserved to a pH < 2.



^{* =} Outside of Control Limits.

Method: RSKSOP-147/175

# Matrix Spike Summary Job Number: TC20885

Account: PESTXST EarthCon Consultants

**Project:** Quarterly Well Sampling, Parker County, Texas

Sample TC21021-2MS TC21021-2	<b>File ID</b> SS005113.D SS005112.D	<b>Analyzed</b> 12/10/12 12/10/12	By LT LT	Prep Date n/a n/a	Prep Batch n/a n/a	Analytical Batch GSS234 GSS234

The QC reported here applies to the following samples:

CAS No.	Compound	TC2102 ug/l	• .		MS %	Limits
74-82-8	Methane	1.49	21.5	24.3	106	68-139



^{* =} Outside of Control Limits.

Method: RSKSOP-147/175

# **Duplicate Summary Job Number:** TC20885

PESTXST EarthCon Consultants Account:

**Project:** Quarterly Well Sampling, Parker County, Texas

Sample TC20879-1DUP TC20879-1	File ID SS005062.D SS005061.D	Analyzed 12/07/12 12/07/12	By LT LT	Prep Date n/a n/a	Prep Batch n/a n/a	Analytical Batch GSS233 GSS233

The QC reported here applies to the following samples:

CAS No.	Compound	TC20879-1 ug/l Q	DUP ug/l Q	RPD	Limits
74-85-1	Ethene	1.0 U	ND	nc	27
74-84-0	Ethane	1.0 U	ND	nc	43
74-98-6	Propane	1.5 U	ND	nc	21
75-28-5	Isobutane	1.5 U	ND	nc	35
106-97-8	Butane	1.5 U	ND	nc	33



^{* =} Outside of Control Limits.

Method: RSKSOP-147/175

# **Duplicate Summary Job Number:** TC20885

**Account:** PESTXST EarthCon Consultants

**Project:** Quarterly Well Sampling, Parker County, Texas

Sample TC21021-1DUP TC21021-1	<b>File ID</b> SS005111.D SS005110.D	<b>Analyzed</b> 12/10/12 12/10/12	By LT LT	Prep Date n/a n/a	Prep Batch n/a n/a	Analytical Batch GSS234 GSS234

The QC reported here applies to the following samples:

		TC21021-1					
CAS No.	Compound	ug/l	Q	ug/l	Q	RPD	Limits
74-82-8	Methane	0.88		0.86		2	53



^{* =} Outside of Control Limits.



12/12/12



### Technical Report for

EarthCon Consultants

Quarterly Well Sampling, Parker County, Texas

3rd Quarter / WW6-Tho

Accutest Job Number: TC20878

Sampling Date: 12/01/12

### Report to:

EarthCon Consultants 4800 Sugar Grove Suite 420 Stafford, TX 77477

gfloreslovo@earthcon.com; djackson@jacksonsjoberg.com; mcpatton@rangeresources.com; escott@earthcon.com

ATTN: Gabriela Floreslovo

Total number of pages in report: 26



Test results contained within this data package meet the requirements of the National Environmental Laboratory Accreditation Conference and/or state specific certification programs as applicable.

Richard Rouriguez Laboratory Director

Client Service contact: Elessa Sommers 713-271-4700

Certifications: TX (T104704220-12-8) AR (11-028-0) AZ (AZ0769) FL (E87628) KS (E-10366) LA (85695/04004) OK (211-035)

This report shall not be reproduced, except in its entirety, without the written approval of Accutest Laboratories. Test results relate only to samples analyzed.

### **Sections:**

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7.4: Duplicate Summary	



7

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4







# **Sample Summary**

EarthCon Consultants

Job No:

TC20878

Quarterly Well Sampling, Parker County, Texas Project No: 3rd Quarter / WW6-Tho

Sample Number	Collected	Doggivad	Matrix Received Code Type		Client	
Number	Date	Time By	Keceiveu	Code	туре	Sample ID
TC20878-1	12/01/12	15:15	12/04/12	AQ	Ground Water	WW6-THO-120112





#### SAMPLE DELIVERY GROUP CASE NARRATIVE

Client: EarthCon Consultants Job No TC20878

Site: Quarterly Well Sampling, Parker County, Texas Report Date 12/12/2012 10:34:08 A

1 Sample was collected on 12/01/2012 and received intact at Accutest on 12/04/2012 and properly preserved in 1 cooler at 2.4 Deg C. The sample received an Accutest job number of TC20878. A listing of the Laboratory Sample ID, Client Sample ID and date of collection are presented in the Results Summary Section of this report.

Except as noted below, all method specified calibrations and quality control performance criteria were met for this job. For more information, please refer to QC summary pages.

#### Volatiles by GCMS By Method SW846 8260B

Matrix AQ Batch ID: VX1673

- All samples were analyzed within the recommended method holding time.
- All method blanks for this batch meet method specific criteria.
- Sample(s) TC20864-1MS, TC20864-1MSD were used as the QC samples indicated.

#### Volatiles by GC By Method RSKSOP-147/175

Matrix AQ Batch ID: GSS233

- All samples were analyzed within the recommended method holding time.
- All method blanks for this batch meet method specific criteria.
- Sample(s) TC20879-1DUP, TC20970-2MS were used as the QC samples indicated.
- Matrix Spike Recovery for Methane is outside control limits. Outside control limits due to high level in sample relative to spike
- TC20970-2MS: Sample was not preserved to a pH < 2.

Accutest Laboratories Gulf Coast (ALGC) certifies that this report meets the project requirements for analytical data produced for the samples as received at ALGC and as stated on the COC. ALGC certifies that the data meets the Data QualityObjectives for precision, accuracy and completeness as specified in the ALGC Quality Manual except as noted above. This report is to be used in its entirety. ALGC is not responsible for any assumptions of data quality if partial data packages are used



# **Summary of Hits Job Number:** TC20878

Account: EarthCon Consultants

**Project:** Quarterly Well Sampling, Parker County, Texas

12/01/12 **Collected:** 

Lab Sample ID Analyte	Client Sample ID	Result/ Qual	MQL	SDL	Units	Method
TC20878-1	WW6-THO-12011	2				
Methane Ethane		0.577 0.0350	0.0050 0.0010	0.0030 0.00050	mg/l	RSKSOP-147/175 RSKSOP-147/175





Sample Results
Report of Analysis



### 4

## **Report of Analysis**

Client Sample ID: WW6-THO-120112

 Lab Sample ID:
 TC20878-1
 Date Sampled:
 12/01/12

 Matrix:
 AQ - Ground Water
 Date Received:
 12/04/12

 Method:
 SW846 8260B
 Percent Solids:
 n/a

**Project:** Quarterly Well Sampling, Parker County, Texas

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	<b>Analytical Batch</b>
Run #1	X0087075.D	1	12/06/12	CF	n/a	n/a	VX1673
Run #2							

	Purge Volume	
Run #1	5.0 ml	
Run #2		

### **Purgeable Aromatics**

CAS No.	Compound	Result	MQL	SDL	Units	Q
71-43-2 108-88-3 100-41-4 1330-20-7	Benzene Toluene Ethylbenzene Xylene (total)	0.00034 U 0.00033 U 0.00032 U 0.00087 U	0.0010 0.0010 0.0010 0.0030	0.00034 0.00033 0.00032 0.00087	mg/l mg/l mg/l mg/l	
CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits		
1868-53-7 17060-07-0 2037-26-5 460-00-4	Dibromofluoromethane 1,2-Dichloroethane-D4 Toluene-D8 4-Bromofluorobenzene	107% 97% 98% 99%		72-122% 68-124% 80-119% 72-126%		

 $\begin{array}{ll} U = & Not \; detected & SDL \; - \; Sample \; Detection \; Limit \\ MQL = & Method \; Quantitation \; Limit \end{array}$ 

E = Indicates value exceeds calibration range

J = Indicates an estimated value

B = Indicates analyte found in associated method blank N = Indicates presumptive evidence of a compound



## **Report of Analysis**

Client Sample ID: WW6-THO-120112

 Lab Sample ID:
 TC20878-1
 Date Sampled:
 12/01/12

 Matrix:
 AQ - Ground Water
 Date Received:
 12/04/12

 Method:
 RSKSOP-147/175
 Percent Solids:
 n/a

**Project:** Quarterly Well Sampling, Parker County, Texas

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	SS005059.D	1	12/07/12	LT	n/a	n/a	GSS233
Run #2	SS005060.D	10	12/07/12	LT	n/a	n/a	GSS233

### **RSK147 Special List**

CAS No.	Compound	Result	MQL	SDL	Units	Q
74-82-8	Methane	0.577 a	0.0050	0.0030	mg/l	
74-85-1	Ethene	0.00050 U	0.0010	0.00050	mg/l	
74-84-0	Ethane	0.0350	0.0010	0.00050	mg/l	
74-98-6	Propane	0.00075 U	0.0015	0.00075	mg/l	
75-28-5	Isobutane	0.00075 U	0.0015	0.00075	mg/l	
106-97-8	Butane	0.00075 U	0.0015	0.00075	mg/l	

(a) Result is from Run# 2

U = Not detected

SDL - Sample Detection Limit

MQL = Method Quantitation Limit

E = Indicates value exceeds calibration range

J = Indicates an estimated value

B = Indicates analyte found in associated method blank N = Indicates presumptive evidence of a compound





Misc. Forms

Custody Documents and Other Forms

Includes the following where applicable:

- Chain of Custody
- LRC Form



### CHAIN OF CUSTODY

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TC20878: Chain of Custody Page 1 of 4





### **Accutest Laboratories Sample Receipt Summary**

Accutest Job Number: TC20878	Client: EARTHCO	ON CONSUI	TANTS	Project:	3RD QTR WELI	L SAMPLI	NG,PAR	KER COUNTY,T
Date / Time Received: 12/4/2012	Delivery	Method:	Client	Airbill #'s:				_
No. Coolers: 1 Therm ID	: IR6			Temp Adjust	ment Factor:	0.2		
Cooler Temps (Initial/Adjusted): #1: (2.	<u>2/2.4)</u>							
Cooler Security Y or N		Y or I	Sample Integr	ity - Documer	ntation	<u>Y</u>	or N	<u>L</u>
1. Custody Seals Present:	3. COC Present:	<b>✓</b>	1. Sample label	ls present on bo	ttles:	<b>✓</b>		
2. Custody Seals Intact:   ✓   ✓	4. Smpl Dates/Time OK	✓ [	2. Container lab	eling complete:		<b>✓</b>		
Cooler Temperature Y or	<u>N_</u>		3. Sample conta	ainer label / CO	C agree:	<b>✓</b>		
1. Temp criteria achieved:			Sample Integ	rity - Conditio	n	<u>Y</u>	or N	<u>L</u>
Cooler temp verification: Infared	Gun		Sample recvo		_	<b>✓</b>		
3. Cooler media: Ice (ba	ag)		· ·	s accounted for:		<b>✓</b>	Г	٦
Quality Control Preservation Y or	N N/A	WTB ST	3. Condition of	sample:			Intact	
1. Trip Blank present / cooler:		✓ □	Sample Integ	rity - Instructi	ons	Υ	or N	N/A
2. Trip Blank listed on COC:			-	uested is clear:		<u> </u>		
3. Samples preserved properly:			2. Bottles recei	ived for unspeci	ied tests		<u>✓</u>	
4. VOCs headspace free:	<b>v</b>		3. Sufficient vo	lume recvd for a	nalysis:	<b>✓</b>		
			<ol> <li>Compositing</li> </ol>	instructions cle	ar:			$\checkmark$
			5. Filtering inst	ructions clear:				$\checkmark$
Comments - Received trip blank not listed or								
- Received one of six vials with h	eadspace bigger than po	ea size.						

TC20878: Chain of Custody Page 2 of 4

Page 1 of 3







### **Problem Resolution**

Accutest Job Number: TC20878

CSR: Elessa Sommers Response Date: 12/5/2012

**Response:** Trip blank is on separate report. Sufficient number of vials without headspace are available for the analyses requested.

TC20878: Chain of Custody Page 3 of 4







### Sample Receipt Log

 Job #:
 TC20878
 Date / Time Received:
 12/4/2012 9:22:00 AM
 Initials:
 CH

Client: EARTHCON CONSULTANTS

Cooler #	Sample ID:	Vol	Bot #	Location	Pres	рН	Therm ID	Initial Temp	Therm CF	Corrected Temp
1	TC20878-1	40ml	1	VR	HCL	Note #1 - Preservative to be checked by analyst at the instrument.	IR6	2.2	0.2	2.4
1	TC20878-1	40ml	2	VR	HCL	Note #1 - Preservative to be checked by analyst at the instrument.	IR6	2.2	0.2	2.4
1	TC20878-1	40ml	3	VR	HCL	Note #1 - Preservative to be checked by analyst at the instrument.	IR6	2.2	0.2	2.4
1	TC20878-1	40ml	4	VR	HCL	Note #1 - Preservative to be checked by analyst at the instrument.	IR6	2.2	0.2	2.4
1	TC20878-1	40ml	5	VR	HCL	Note #1 - Preservative to be checked by analyst at the instrument.	IR6	2.2	0.2	2.4
1	TC20878-1	40ml	6	VR	HCL	Note #1 - Preservative to be checked by analyst at the instrument.	IR6	2.2	0.2	2.4

TC20878: Chain of Custody

Page 4 of 4



#### **Laboratory Data Package Cover Page Appendix A**

This signature page, the laboratory review checklist, and the following reportable data:

Field chain-of-custody documentation;

TC20878 This data package consists of

QA Manager Name (Printed)

Richard Rodriguez

Signature

	R2	Sample identification cross-reference;	
Ģ	R3	Test reports (analytical data sheets) for	or each environmental sample that includes:
		a)	Items consistent with NELAC 5.13 or ISO/IEC 17025 Section 5.10
		b)	dilution factors,
		c)	preparation methods,
		d)	cleanup methods, and
		e)	if required for the project, tentatively identified compounds (TICs).
Ō	R4	Surrogate recovery data including:	
		a)	Calculated recovery (%R), and
			The laboratory's surrogate QC limits.
Ģ	R5	Test reports/summary forms for blank	samples;
Ģ	R6	Test reports/summary forms for labora	atory control samples (LCSs) including:
			LCS spiking amounts,
			Calculated %R for each analyte, and
			The laboratory's LCS QC limits.
	R7		atrix spike duplicates (MS/MSDs) including:
		•	Samples associated with the MS/MSD clearly identified,
			MS/MSD spiking amounts,
			Concentration of each MS/MSD analyte measured in the parent and
			Calculated %Rs and relative percent differences (RPDs), and
		•	The laboratory's MS/MSD QC limits
Ģ	R8	Laboratory analytical duplicate (if appl	
			The amount of analyte measured in the duplicate,
			The calculated RPD, and
			The laboratory's QC limits for analytical duplicates.
<u> </u>	R9		Ls) and detectability check sample results for each analyte for each
Ģ	R10	Other problems or anomalies.	
			item in Laboratory Review Checklist and for each analyte, matrix, and ditation under the Texas Laboratory Accreditation Program.
memod id	i which the i	laboratory does not note NELAC accred	dialion under the Texas Laboratory Accreditation Program.
Texas Lab the Excep requirement affirm to the	ooratory Acc tion Report. ents of the m ne best of m	reditation Program for all the methods, This data package has been reviewed tethods used, except where noted by the y knowledge, all problems/anomalies, o	laboratory data package. This laboratory is NELAC accredited under the analytes, and matrices reported in this data package except as noted in by the laboratory and is complete and technically compliant with the e laboratory in the attached exception reports. By my signature below, I observed by the laboratory as having the potential to affect the quality of tory Review Checklist, and no information or data have been knowingly
Check, if	applicable:	This laboratory meets an exception un	nder 30 TAC&25.6 and was last inspection by
[]	-	[X ] TCEQ or [ ] on April 20	11. Any findings affecting the data in this laboratory data package are
		noted in the Exception Reports herein	The official signing the cover page of the report in which these data are data package and is by signature affirming the above release statement

Official Title (printed)

Laboratory Director

Date 12/12/2012



	L	ABORATORY REVIEW CHECKLIST: REPORTABLE	DAT	Ά			
Laboratory	/ Name:	Accutest Gulf Coast LRC Date:	12/	/12/2	012		
		Quarterly Well Sampling, Parker					
Project Na		County, Texas Laboratory Project Number:	1	2087	_		
Reviewer	Name:	Anita Patel Prep Batch Number(s):	GSS				
#1	A²	DESCRIPTION	YES	NO	NA°	NR*	ER #5
R1	OI	CHAIN-OF-CUSTODY (C-O-C):					
		Did samples meet the laboratory's standard conditions of sample acceptability	X				
		upon receipt?	X				<u> </u>
		Were all departures from standard conditions described in an exception report?	X				
R2	OI	Sample and quality control (QC) identification	- V				
		Are all field sample ID numbers cross-referenced to the laboratory ID numbers?	X				<u> </u>
		Are all laboratory ID numbers cross-referenced to the corresponding QC data?	X				
R3	OI	Test reports					
		Were samples prepared and analyzed within holding times?  Other than those results <mql, all="" bracketed="" by="" calibration<="" other="" raw="" td="" values="" were=""><td>X</td><td></td><td></td><td></td><td><u> </u></td></mql,>	X				<u> </u>
		· · · · · · · · · · · · · · · · · · ·	Х				
		standards? Were calculations checked by a peer or supervisor?	X				<b>—</b>
		Were all analyte identifications checked by a peer or supervisor?	X				
		Were sample detection limits reported for all analytes not detected?	l x				
		Were all results for soil and sediment samples reported on a dry weight basis?	+^		Х		
		Were % moisture (or solids) reported for all soil and sediment samples?	+		X		
		Were bulk soils/solids samples for volatile analysis extracted with methanol per	+				
		SW846 Method 5035?			Х		
		If required for the project, are TIC's reported?	1		Х		
R4	0	Surrogate recovery data					
		Were surrogates added prior to extraction?	Х				
		Were surrogate percent recoveries in all samples within the laboratory QC limits?	Х				
R5	OI	Test reports/summary forms for blank samples					
		Were appropriate type(s) of blanks analyzed?	Х				
		Were blanks analyzed at the appropriate frequency?	X				
		Were method blanks taken through the entire analytical process, including	l x				
		preparation and, if applicable, cleanup procedures?  Were blank concentrations <mql?< td=""><td><del>                    _     _     _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _</del></td><td></td><td></td><td></td><td><u> </u></td></mql?<>	<del>                    _     _     _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _</del>				<u> </u>
R6	OI	Laboratory control samples (LCS):	X	_		_	
- 10	01	Were all COCs included in the LCS?	X				
		Was each LCS taken through the entire analytical procedure, including prep and					
		cleanup steps?	Х				
		Were LCSs analyzed at required frequency?	X				
		Were LCS (and LCSD, if applicable) %Rs within the laboratory QC limits?	X				
		Does the detectability check sample data document the laboratory's capability to					_
		detect the COCs at the MDL used to calculate the SDLs?	X				5
		Was the LCSD RPD within QC limits?			Χ		
R7	OI	Matrix spike (MS) and matrix spike duplicate (MSD) data					
		Were the project/method specified analytes included in the MS and MSD?	Х				
		Were MS/MSD analyzed at the appropriate frequency?	Х				
		Were MS (and MSD, if applicable) %Rs within the laboratory QC Limits?		Х			4
		Were the MS/MSD RPDs within laboratory QC limits?	X				
R8	OI	Analytical duplicate data					
		Were appropriate analytical duplicates analyzed for each matrix?	X				<u> </u>
		Were analytical duplicates analyzed at the appropriate frequency?	X				<u> </u>
		Were RPDs or relative standard deviations within the laboratory QC limits?	X	_			
R9	OI	Method quantitation limits (MQLs):					
		Are the MQLs for each method analyte included in the laboratory data package?  Do the MQLs correspond to the concentration of the lowest non-zero calibration	X				
		Are unadjusted MQLs and DCSs included in the laboratory data package?	+^-	Х			2
R10	OI	Other problems/anomalies					
1,10	"	Are all known problems/anomalies/special conditions noted in this LRC and ER?	Х				
		Was applicable and available technology used to lower the SDL to minimize the	T X				
		Is the laboratory NELAC-accredited under the Texas Laboratory Accreditation	<del>  ^</del>				
		Program for the analytes, matrices, and methods associated with this laboratory	X				3
		data package?					-
	•	•					



Laboratory	Name:	Accutest Gulf Coast	LRC Date:	12/	12/2	012		
Project Na	me:	Quarterly Well Sampling, Parker	Laboratory Project Number:	TC	2087	78		
Reviewer	Name:	Anita Patel	Prep Batch Number(s):	GSS	233,	VX16	373	
#1	A ²	DESCRIPTION		YES	NO	NA ³	NR⁴	ER#5
S1	OI	Initial calibration (ICAL)						
		Were response factors and/or relative	e response factors for each analyte within QC	х				
		limits?		_ ^				
		Were percent RSDs or correlation co	efficient criteria met?	Х				
		Was the number of standards recom	mended in the method used for all analytes?	Х				
		Were all points generated between the	ne lowest and highest standard used to	x				
		calculate the curve?						
		Are ICAL data available for all instrun	nents used?	Х				
		Has the initial calibration curve been	verified using an appropriate second source	l _x l				
		standard?		_^_				
S2	OI		erification (ICCV AND CCV) and continuing					
		Was the CCV analyzed at the metho		Х				
			alyte within the method-required QC limits?	Х				
		Was the ICAL curve verified for each		Х				
			e concentration in the inorganic CCB <mdl?< td=""><td></td><td></td><td>Х</td><td></td><td></td></mdl?<>			Х		
S3	0	Mass spectral tuning						
		Was the appropriate compound for the		Х				
		Were ion abundance data within the	method-required QC limits?	Х				
S4	0	Internal standards (IS)						
			nes within the method-required QC limits?	Х				
S5	OI	Raw data (NELAC Section 5.5.10)						
		, , , , , , , , , , , , , , , , , , , ,	matograms, spectral data) reviewed by an	l x l				
		analyst?						
		Were data associated with manual in	tegrations flagged on the raw data?	Х	_			
S6	0	Dual column confirmation				L 1/	_	
		Did dual column confirmation results				Х		
S7	0	Tentatively identified compounds	(TICs): ss spectra and TIC data subject to appropriate					
		checks?	ss spectra and TIC data subject to appropriate			Х		
S8		Interference Check Sample (ICS) r	eculte		-			
36	- '	Were percent recoveries within meth				Х		
S9	<u> </u>		kes, and method of standard additions					
39	- '		, and the linearity within the QC limits					
		specified in the method?	, and the inicality within the QO ininto			Х		
S10	OI	Method detection limit (MDL) stud	ios					
0.0	<u> </u>	Was a MDL study performed for each		Х			П	
		Is the MDL either adjusted or suppor		X				5
S11	OI	Proficiency test reports						
			ceptable on the applicable proficiency tests or					
		evaluation studies?	,	X				
S12	OI	Standards documentation						
		Are all standards used in the analyse	es NIST-traceable or obtained from other					
		appropriate source?		X				
S13	OI	Compound/analyte identification p	rocedures					
		Are the procedures for compound/an	alyte identification documented?	Х				
S14	OI	Demonstration of analyst compete	ency (DOC)					
		Was DOC conducted consistent with	NELAC Chapter 5?	Х				
	<u></u>	Is documentation of the analyst's con	npetency up-to-date and on file?	Х				
S15	OI	Verification/validation documentate	tion for methods (NELAC Chapter 5)					
		Are all the methods used to generate	the data documentated, verified, and	Х				
L	<u> </u>	validated, where applicable?		L *		L_	L_	
S16	OI	Laboratory standard operating pro						
		Are laboratory SOPs current and on t	file for each method performed?	Х				



	LABOR	RATORY REVIEW CHEC	KLIST (continued): Exception	n Reports							
Laboratory	Name:	Accutest Gulf Coast	LRC Date:	12/12/2012							
Project Na	me:	Quarterly Well Sampling, Parker	Laboratory Project Number:	TC20878							
Reviewer	Name:	Anita Patel	Prep Batch Number(s):	GSS233, VX1673							
ER# ¹	Description	on									
		01 1	e report as the RL. The unadjusted MQL/RL is	reported in the method							
1 blank. The SDL is defined in the report as the MDL.											
For reporting purposes, the method blank represents the unadjusted MQL. The DCS is on file in the laboratory and is not											
2	2 included in the laboratory data package.										
		,	exas Laboratory Accreditation Program for the	* '							
3	methods a	ssociated with this laboratory data pac	kage for analytes that are listed in the Texas F	ields of Accreditation.							
4	All anomal	ies are discussed in the case narrative	).								
	The labora	tory does not perform DCS analysis fo	or Method RSKSOP-147/175. The component	s reported are not listed or							
5	do not hav	e values in the Texas TRRP PCL table	es.								
			_								
			_								

¹ER# = Exception Report identification number (an Exception Report should be completed for an item if "NR" or "No" is checked on



## GC/MS Volatiles

QC Data Summaries

Includes the following where applicable:

- Method Blank Summaries
- Blank Spike Summaries
- Matrix Spike and Duplicate Summaries



**Method:** SW846 8260B

# Method Blank Summary Job Number: TC20878

PESTXST EarthCon Consultants **Account:** 

**Project:** Quarterly Well Sampling, Parker County, Texas

Sample VX1673-MB	<b>File ID</b> X0087062.D	<b>DF</b> 1	<b>Analyzed</b> 12/06/12	<b>By</b> CF	<b>Prep Date</b> n/a	<b>Prep Batch</b> n/a	Analytical Batch VX1673

### The QC reported here applies to the following samples:

CAS No.	Compound	Result	RL	MDL	Units Q
71-43-2	Benzene	ND	1.0	0.34	ug/l
100-41-4	Ethylbenzene	ND	1.0	0.32	ug/l
108-88-3	Toluene	ND	1.0	0.33	ug/l
1330-20-7	Xylene (total)	ND	3.0	0.87	ug/l

CAS No. Surrogate Recoveries		Limits	
1868-53-7 Dibromofluoromethane	105%	72-122%	
17060-07-0 1,2-Dichloroethane-D4	95%	68-124%	
2037-26-5 Toluene-D8	99%	80-119%	
460-00-4 4-Bromofluorobenzene	98%	72-126%	



**Method:** SW846 8260B

# Blank Spike Summary Job Number: TC20878

Account: PESTXST EarthCon Consultants

Quarterly Well Sampling, Parker County, Texas **Project:** 

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	<b>Analytical Batch</b>
VX1673-BS	X0087060.D	1	12/06/12	CF	n/a	n/a	VX1673

The QC reported here applies to the following samples:

CAS No.	Compound	Spike ug/l	BSP ug/l	BSP %	Limits
71-43-2	Benzene	25	22.2	89	68-119
100-41-4	Ethylbenzene	25	22.1	88	71-117
108-88-3	Toluene	25	22.4	90	73-119
1330-20-7	Xylene (total)	75	67.7	90	74-119

CAS No.	<b>Surrogate Recoveries</b>	BSP	Limits
1868-53-7	Dibromofluoromethane	101%	72-122%
17060-07-0	1,2-Dichloroethane-D4	99%	68-124%
2037-26-5	Toluene-D8	101%	80-119%
460-00-4	4-Bromofluorobenzene	92%	72-126%



^{* =} Outside of Control Limits.

# 6.3.1

Page 1 of 1

**Method:** SW846 8260B

# Matrix Spike/Matrix Spike Duplicate Summary

Job Number: TC20878

**Account:** PESTXST EarthCon Consultants

**Project:** Quarterly Well Sampling, Parker County, Texas

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	<b>Analytical Batch</b>
TC20864-1MS	X0087064.D	1	12/06/12	CF	n/a	n/a	VX1673
TC20864-1MSD	X0087065.D	1	12/06/12	CF	n/a	n/a	VX1673
TC20864-1	X0087063.D	1	12/06/12	CF	n/a	n/a	VX1673

The QC reported here applies to the following samples:

CAS No.	Compound	TC20864-1 ug/l Q	Spike ug/l	MS ug/l	MS %	MSD ug/l	MSD %	RPD	Limits Rec/RPD
71-43-2	Benzene	1.0 U	25	23.0	92	22.4	90	3	68-119/12
100-41-4	Ethylbenzene	1.0 U	25	22.7	91	22.4	90	1	71-117/12
108-88-3	Toluene	1.0 U	25	22.9	92	22.5	90	2	73-119/13
1330-20-7	Xylene (total)	3.0 U	75	69.8	93	68.4	91	2	74-119/13

CAS No.	<b>Surrogate Recoveries</b>	MS	MSD	TC20864-1	Limits
1868-53-7	Dibromofluoromethane	103%	101%	105%	72-122%
17060-07-0	1,2-Dichloroethane-D4	98%	98%	96%	68-124%
2037-26-5	Toluene-D8	100%	100%	100%	80-119%
460-00-4	4-Bromofluorobenzene	91%	92%	98%	72-126%



^{* =} Outside of Control Limits.



## GC Volatiles

# QC Data Summaries

### Includes the following where applicable:

- Method Blank Summaries
- Blank Spike Summaries
- Matrix Spike and Duplicate Summaries



Method: RSKSOP-147/175

# Method Blank Summary Job Number: TC20878

Job Number:

PESTXST EarthCon Consultants **Account:** 

**Project:** Quarterly Well Sampling, Parker County, Texas

Sample GSS233-MB	<b>File ID</b> SS005056.D	<b>DF</b> 1	<b>Analyzed</b> 12/07/12	By LT	Prep Date n/a	Prep Batch n/a	Analytical Batch GSS233

The QC reported here applies to the following samples:

CAS No.	Compound	Result	RL	MDL	Units Q
74-82-8	Methane	ND	0.50	0.30	ug/l
74-85-1	Ethene	ND	1.0	0.50	ug/l
74-84-0	Ethane	ND	1.0	0.50	ug/l
74-98-6	Propane	ND	1.5	0.75	ug/l
75-28-5	Isobutane	ND	1.5	0.75	ug/l
106-97-8	Butane	ND	1.5	0.75	ug/l



Method: RSKSOP-147/175

# Blank Spike Summary Job Number: TC20878

Account: PESTXST EarthCon Consultants

Quarterly Well Sampling, Parker County, Texas **Project:** 

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	<b>Analytical Batch</b>
GSS233-BS	SS005054.D	1	12/07/12	LT	n/a	n/a	GSS233

The QC reported here applies to the following samples:

CAS No.	Compound	Spike ug/l	BSP ug/l	BSP %	Limits
74-82-8	Methane	21.5	16.2	75	68-139
74-85-1	Ethene	57.4	43.2	75	52-145
74-84-0	Ethane	43.3	47.1	109	68-131
74-98-6	Propane	60.6	60.5	100	69-131
75-28-5	Isobutane	72.5	70.4	97	72-131
106-97-8	Butane	76.6	73.6	96	66-128



^{* =} Outside of Control Limits.

Method: RSKSOP-147/175

# **Matrix Spike Summary**

Job Number: TC20878

**Account:** PESTXST EarthCon Consultants

**Project:** Quarterly Well Sampling, Parker County, Texas

Sample TC20970-2MS ^a TC20970-2 ^a	<b>File ID</b> SS005067.D SS005066.D	<b>Analyzed</b> 12/07/12 12/07/12	By LT LT	Prep Date n/a n/a	Prep Batch n/a n/a	Analytical Batch GSS233 GSS233

The QC reported here applies to the following samples:

CAS No.	Compound	TC20970-2 ug/l Q	Spike ug/l	MS ug/l	MS %	Limits
74-82-8	Methane	105	21.5	95.8	-42* b	68-139
74-85-1	Ethene	ND	57.4	46.6	81	52-145
74-84-0	Ethane	4.71	43.3	46.7	97	68-131
74-98-6	Propane	ND	60.6	53.4	88	69-131
75-28-5	Isobutane	ND	72.5	61.8	85	72-131
106-97-8	Butane	ND	76.6	66.0	86	66-128

⁽a) Sample was not preserved to a pH < 2.



⁽b) Outside control limits due to high level in sample relative to spike amount.

^{* =} Outside of Control Limits.

Method: RSKSOP-147/175

# **Duplicate Summary Job Number:** TC20878

**Account:** PESTXST EarthCon Consultants

**Project:** Quarterly Well Sampling, Parker County, Texas

Sample TC20879-1DUP TC20879-1	File ID SS005062.D SS005061.D	Analyzed 12/07/12 12/07/12	By LT LT	Prep Date n/a n/a	Prep Batch n/a n/a	Analytical Batch GSS233 GSS233

The QC reported here applies to the following samples:

CAS No.	Compound	TC20879-1 ug/l Q	DUP ug/l Q	RPD	Limits
74-82-8	Methane	4.10	3.34	20	53
74-85-1	Ethene	1.0 U	ND	nc	27
74-84-0	Ethane	1.0 U	ND	nc	43
74-98-6	Propane	1.5 U	ND	nc	21
75-28-5	Isobutane	1.5 U	ND	nc	35
106-97-8	Butane	1.5 U	ND	nc	33



^{* =} Outside of Control Limits.



### ANALYSIS REPORT

Lab #: 321086 Job #: 20030

Sample Name/Number: WW6-Tho-120112
Company: Oil Tracers, LLC
Date Sampled: 12/01/2012

Container: Dissolved Gas Bottle

Field/Site Name: Third Quarter Well Sampling

Location: Parker County, Texas

Formation/Depth: Sampling Point:

Date Received: 12/05/2012

Date Reported: 2/01/2013

Component	Chemical mol. %	δ ¹³ C ‰	δD ‰	δ ¹⁸ Ο ‰
Carbon Monoxide	nd			
Hydrogen Sulfide	na			
Helium	na			
Hydrogen	nd			
Argon	1.64			
Oxygen	0.16			
Nitrogen	87.87			
Carbon Dioxide	0.28			
Methane	9.94	-41.82	-124.0	
Ethane	0.106	-16.3		
Ethylene	nd			
Propane	nd			
Propylene	nd			
Iso-butane	nd			
N-butane	0.0009			
Iso-pentane	nd			
N-pentane	nd			
Hexanes +	nd			

#### Remarks:

Analysis is of gas extracted from water by headspace equilibration. Analysis has been corrected for helium added to create headspace. Helium dilution factor = 0.76

nd = not detected. na = not analyzed. Isotopic composition of hydrogen is relative to VSMOW. Isotopic composition of carbon is relative to VPDB. Isotopic composition of oxygen is relative to VSMOW, except for carbon dioxide which is relative to VPDB. Calculations for BTU and specific gravity per ASTM D3588. Chemical compositions are normalized to 100%. Mol. % is approximately equal to vol. %.

^{*}Addition of helium negates the ability to detect native helium and may negate the ability to detect hydrogen.

^{**} Ethane isotopes and dD isotopes of methane were obtained online via GC-C/P-IRMS



12/12/12



## Technical Report for

EarthCon Consultants

Quarterly Well Sampling, Parker County, Texas

3rd Quarter / WW21-Van

Accutest Job Number: TC20879

Sampling Date: 11/30/12

## Report to:

EarthCon Consultants 4800 Sugar Grove Suite 420 Stafford, TX 77477

gfloreslovo@earthcon.com; djackson@jacksonsjoberg.com; mcpatton@rangeresources.com; escott@earthcon.com

ATTN: Gabriela Floreslovo

Total number of pages in report: 26



Test results contained within this data package meet the requirements of the National Environmental Laboratory Accreditation Conference and/or state specific certification programs as applicable.

Richard Rollriguez Laboratory Director

Client Service contact: Elessa Sommers 713-271-4700

Certifications: TX (T104704220-12-8) AR (11-028-0) AZ (AZ0769) FL (E87628) KS (E-10366) LA (85695/04004) OK (211-035)

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6.2: Blank Spike Summary	20
6.3: Matrix Spike/Matrix Spike Duplicate Summary	21
Section 7: GC Volatiles - QC Data Summaries	
7.1: Method Blank Summary	23
7.2: Blank Spike Summary	24
7.3: Matrix Spike Summary	25
7.4: Duplicate Summary	



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# **Sample Summary**

EarthCon Consultants

Job No: TC20879

Quarterly Well Sampling, Parker County, Texas Project No: 3rd Quarter / WW21-Van

Sample	Collected		Matrix			Client
Number	Date Time By		Received	Code	Type	Sample ID
TC20879-1	11/30/12	17:10	12/04/12	AQ	Ground Water	WW21-VAN-113012





### SAMPLE DELIVERY GROUP CASE NARRATIVE

Client: EarthCon Consultants Job No TC20879

Site: Quarterly Well Sampling, Parker County, Texas Report Date 12/12/2012 10:36:59 A

1 Sample was collected on 11/30/2012 and received intact at Accutest on 12/04/2012 and properly preserved in 1 cooler at 2.4 Deg C. The sample received an Accutest job number of TC20879. A listing of the Laboratory Sample ID, Client Sample ID and date of collection are presented in the Results Summary Section of this report.

Except as noted below, all method specified calibrations and quality control performance criteria were met for this job. For more information, please refer to QC summary pages.

### Volatiles by GCMS By Method SW846 8260B

Matrix AQ Batch ID: VX1673

- All samples were analyzed within the recommended method holding time.
- All method blanks for this batch meet method specific criteria.
- Sample(s) TC20864-1MS, TC20864-1MSD were used as the QC samples indicated.

### Volatiles by GC By Method RSKSOP-147/175

Matrix AQ Batch ID: GSS233

- All samples were analyzed within the recommended method holding time.
- All method blanks for this batch meet method specific criteria.
- Sample(s) TC20879-1DUP, TC20970-2MS were used as the QC samples indicated.
- Matrix Spike Recovery for Methane is outside control limits. Outside control limits due to high level in sample relative to spike
- TC20970-2MS: Sample was not preserved to a pH < 2.

Accutest Laboratories Gulf Coast (ALGC) certifies that this report meets the project requirements for analytical data produced for the samples as received at ALGC and as stated on the COC. ALGC certifies that the data meets the Data QualityObjectives for precision, accuracy and completeness as specified in the ALGC Quality Manual except as noted above. This report is to be used in its entirety. ALGC is not responsible for any assumptions of data quality if partial data packages are used



**Summary of Hits Job Number:** TC20879

**Account:** EarthCon Consultants

**Project:** Quarterly Well Sampling, Parker County, Texas

11/30/12 **Collected:** 

Lab Sample ID Analyte	Client Sample ID	Result/ Qual	MQL	SDL	Units	Method
TC20879-1	WW21-VAN-1130	12				

0.00410 Methane 0.00050 0.00030 mg/lRSKSOP-147/175



Sample Results		
Report of Analysis		



# **Report of Analysis**

Client Sample ID: WW21-VAN-113012

 Lab Sample ID:
 TC20879-1
 Date Sampled:
 11/30/12

 Matrix:
 AQ - Ground Water
 Date Received:
 12/04/12

 Method:
 SW846 8260B
 Percent Solids:
 n/a

**Project:** Quarterly Well Sampling, Parker County, Texas

	File ID	DF	Analyzed	$\mathbf{B}\mathbf{y}$	<b>Prep Date</b>	Prep Batch	<b>Analytical Batch</b>	
Run #1	X0087076.D	1	12/06/12	CF	n/a	n/a	VX1673	
Run #2								

	Purge Volume	
Run #1	5.0 ml	
Run #2		

### **Purgeable Aromatics**

CAS No.	Compound	Result	MQL	SDL	Units	Q
71-43-2 108-88-3 100-41-4 1330-20-7	Benzene Toluene Ethylbenzene Xylene (total)	0.00034 U 0.00033 U 0.00032 U 0.00087 U	0.0010 0.0010 0.0010 0.0030	0.00034 0.00033 0.00032 0.00087	mg/l mg/l mg/l mg/l	
CAS No.	<b>Surrogate Recoveries</b>	Run# 1	Run# 2	Limits		
1868-53-7 17060-07-0 2037-26-5 460-00-4	Dibromofluoromethane 1,2-Dichloroethane-D4 Toluene-D8 4-Bromofluorobenzene	107% 96% 98% 98%		72-122% 68-124% 80-119% 72-126%		

 $\begin{array}{ll} U = & Not \; detected & SDL \; - \; Sample \; Detection \; Limit \\ MQL = & Method \; Quantitation \; Limit \\ \end{array}$ 

E = Indicates value exceeds calibration range

J = Indicates an estimated value

B = Indicates analyte found in associated method blank N = Indicates presumptive evidence of a compound



## 4

# **Report of Analysis**

Client Sample ID: WW21-VAN-113012

 Lab Sample ID:
 TC20879-1
 Date Sampled:
 11/30/12

 Matrix:
 AQ - Ground Water
 Date Received:
 12/04/12

 Method:
 RSKSOP-147/175
 Percent Solids:
 n/a

**Project:** Quarterly Well Sampling, Parker County, Texas

	File ID	DF	Analyzed	By	<b>Prep Date</b>	<b>Prep Batch</b>	<b>Analytical Batch</b>	
Run #1	SS005061.D	1	12/07/12	LT	n/a	n/a	GSS233	
Run #2								

### **RSK147 Special List**

Compound	Result	MQL	SDL	Units	Q
Methane	0.00410	0.00050	0.00030	mg/l	
Ethene	0.00050 U	0.0010	0.00050	mg/l	
Ethane	0.00050 U	0.0010	0.00050	mg/l	
Propane	0.00075 U	0.0015	0.00075	mg/l	
Isobutane	0.00075 U	0.0015	0.00075	mg/l	
Butane	0.00075 U	0.0015	0.00075	mg/l	
	Methane Ethene Ethane Propane Isobutane	Methane       0.00410         Ethene       0.00050 U         Ethane       0.00050 U         Propane       0.00075 U         Isobutane       0.00075 U	Methane         0.00410         0.00050           Ethene         0.00050 U         0.0010           Ethane         0.00050 U         0.0010           Propane         0.00075 U         0.0015           Isobutane         0.00075 U         0.0015	Methane         0.00410         0.00050         0.00030           Ethene         0.00050 U         0.0010         0.00050           Ethane         0.00050 U         0.0010         0.00050           Propane         0.00075 U         0.0015         0.00075           Isobutane         0.00075 U         0.0015         0.00075	Methane         0.00410         0.00050         0.00030         mg/l           Ethene         0.00050 U         0.0010         0.00050 mg/l           Ethane         0.00050 U         0.0010         0.00050 mg/l           Propane         0.00075 U         0.0015         0.00075 mg/l           Isobutane         0.00075 U         0.0015         0.00075 mg/l

U = Not detected SDL - Sample Detection Limit

MQL = Method Quantitation Limit E = Indicates value exceeds calibration range J = Indicates an estimated value

B = Indicates analyte found in associated method blank N = Indicates presumptive evidence of a compound





Misc. Forms

Custody Documents and Other Forms

Includes the following where applicable:

- Chain of Custody
- LRC Form



PAGE 1 OF (

### CHAIN OF CUSTODY

<u>r</u> a	
ACCUTEST	
 Labarataries	

CACCUTEST													FED-E	X Tracking	#				Bottle Or	der Conti	ol#			
Laboratories			10165 Harv TEL. 713	-271-4700	FAX:	713-2							Accut	est Quote #	-				Accutest	Job#_	10	76	0	879
Client / Reporting Information		A	Project I		ccutest.co	23,61							8			Req	ues	t e d	Ana	yse	s			Matrix Codes
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Company Name				_										Je,									1	
EarthCon Consultants, Inc.	Third Quarterl	y Well Samplin	g, Parker C	ounty, 1	Texas		12.000	interior de	50490			ang maran	NE.	ţ.			1				-			OW - Drinking Water GW - Ground Water
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Gabriela Floreslovo														Ethene, Isobutane, Methane,										LIQ - Other Liquid AIR - Air
Phone # Fax #	Client Purchase C	rder#		City				Sta	ate		Z	ip		the 175	1		1							SOL - Other Solid WP - Wipe
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Sampler(s) Name(s) Phone #	Project Manager			Attention	:									le sa			l							
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Sample # Field ID / Point of Collection	Date	Time	Sampled By	Matrix	bottles	포	žã	ΞΞ	ž	۵≥	F	ž 🖽	0 "	_	+	_	┼	-	-	-		$\vdash$	$\dashv$	
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TC20879: Chain of Custody Page 1 of 4







## **Accutest Laboratories Sample Receipt Summary**

Accutest Job Number: TC20879	Client:	EARTHCON CONSULTAI	NTS	Project: 3RD QTR WEL	L SAMPLING	,PARKE	R COUNTY,T
Date / Time Received: 12/4/2012		Delivery Method:	Client	Airbill #'s:			
No. Coolers: 1 There	m ID: IR6			Temp Adjustment Factor:	0.2		
Cooler Temps (Initial/Adjusted): #1	: (2.2/2.4)						
Cooler Security Y or N		Y or N	Sample Integ	grity - Documentation	<u>Y</u> o	r N	
<ol> <li>Custody Seals Present:</li> <li>Custody Seals Intact:</li> </ol>	•			els present on bottles: abeling complete:	<b>✓</b>		
·	or N			ntainer label / COC agree:	<b>✓</b>		
	ared Gun		Sample Inte	grity - Condition	<u>Y</u> •	r N	
3. Cooler media: Id	e (bag) or N N/A		All containe     Condition or	ers accounted for: f sample:	<b>✓</b> Int	act	
1. Trip Blank present / cooler:		<b>V</b>	Sample Inte	grity - Instructions	<u>Y</u> o	r N	N/A
2. Trip Blank listed on COC:	<b>V</b>		1. Analysis re	equested is clear:	<b>✓</b>		
3. Samples preserved properly:			2. Bottles rec	eived for unspecified tests		✓	
4. VOCs headspace free:   ✓				olume recvd for analysis: ng instructions clear:	<b>Z</b>		<b>V</b>
			· ·	structions clear:			✓
Comments - Received trip blank not list - Received six vials, COC list							

TC20879: Chain of Custody Page 2 of 4

Page 1 of 3







### **Problem Resolution**

Accutest Job Number: TC20879

CSR: Elessa Sommers Response Date: 12/5/2012

Response: Trip blank is on separate report.

TC20879: Chain of Custody Page 3 of 4







### Sample Receipt Log

 Job #:
 TC20879
 Date / Time Received:
 12/4/2012 9:22:00 AM
 Initials:
 CH

Client: EARTHCON CONSULTANTS

Cooler #	Sample ID:	Vol	Bot #	Location	Pres	рН	Therm ID	Initial Temp	Therm CF	Corrected Temp
1	TC20879-1	40ml	1	VR	HCL	Note #1 - Preservative to be checked by analyst at the instrument.	IR6	2.2	0.2	2.4
1	TC20879-1	40ml	2	VR	HCL	Note #1 - Preservative to be checked by analyst at the instrument.	IR6	2.2	0.2	2.4
1	TC20879-1	40ml	3	VR	HCL	Note #1 - Preservative to be checked by analyst at the instrument.	IR6	2.2	0.2	2.4
1	TC20879-1	40ml	4	VR	HCL	Note #1 - Preservative to be checked by analyst at the instrument.	IR6	2.2	0.2	2.4
1	TC20879-1	40ml	5	VR	HCL	Note #1 - Preservative to be checked by analyst at the instrument.	IR6	2.2	0.2	2.4
1	TC20879-1	40ml	6	VR	HCL	Note #1 - Preservative to be checked by analyst	IR6	2.2	0.2	2.4

TC20879: Chain of Custody

Page 4 of 4



### Laboratory Data Package Cover Page Appendix A

This signature page, the laboratory review checklist, and the following reportable data:

TC20879 This data package consists of

QA Manager Name (Printed)

Richard Rodriguez

Signature

ė	R1	Field chain-of-custody docume	entation;
	R2	Sample identification cross-ref	ference;
Ģ	R3	Test reports (analytical data sh	neets) for each environmental sample that includes:
		a)	Items consistent with NELAC 5.13 or ISO/IEC 17025 Section 5.10
		b)	dilution factors,
		c)	preparation methods,
		d)	cleanup methods, and
		e)	if required for the project, tentatively identified compounds (TICs).
	R4	Surrogate recovery data include	ding:
		a)	Calculated recovery (%R), and
		b)	The laboratory's surrogate QC limits.
	R5	Test reports/summary forms for	or blank samples;
	R6	Test reports/summary forms for	or laboratory control samples (LCSs) including:
		a)	LCS spiking amounts,
		b)	Calculated %R for each analyte, and
		c)	The laboratory's LCS QC limits.
	R7	Test reports for project matrix:	spike/matrix spike duplicates (MS/MSDs) including:
		a)	Samples associated with the MS/MSD clearly identified,
		b)	MS/MSD spiking amounts,
		c)	Concentration of each MS/MSD analyte measured in the parent and
		d)	Calculated %Rs and relative percent differences (RPDs), and
		e)	The laboratory's MS/MSD QC limits
	R8	Laboratory analytical duplicate	e (if applicable) recovery and precision:
		a)	The amount of analyte measured in the duplicate,
		b)	The calculated RPD, and
		c)	The laboratory's QC limits for analytical duplicates.
Ģ	R9		its (MQLs) and detectability check sample results for each analyte for each
Ģ	R10	Other problems or anomalies.	
			d (NR)" item in Laboratory Review Checklist and for each analyte, matrix, and
method fo	or which the	laboratory does not hold NELAC	Caccreditation under the Texas Laboratory Accreditation Program.
Release	Statement:	I am responsible for the release	e of this laboratory data package. This laboratory is NELAC accredited under the
Texas Lal	ooratory Acc	creditation Program for all the me	ethods, analytes, and matrices reported in this data package except as noted in
the Excep	tion Report	. This data package has been re	eviewed by the laboratory and is complete and technically compliant with the
requireme	ents of the m	nethods used, except where note	ed by the laboratory in the attached exception reports. By my signature below, I
affirm to the	ne best of m	ny knowledge, all problems/anon	nalies, observed by the laboratory as having the potential to affect the quality of
the data, I	nave been i	dentified by the laboratory in the	Laboratory Review Checklist, and no information or data have been knowingly
withheld.			
	applicable	•	ption under 30 TAC&25.6 and was last inspection by
[]			April 2011. Any findings affecting the data in this laboratory data package are
			s herein. The official signing the cover page of the report in which these data are
		used is responsible for releasing	ng this data package and is by signature affirming the above release statement

Official Title (printed)

Laboratory Director

Date 12/12/2012



	L	ABORATORY REVIEW CHECKLIST: REPORTABLE	DAT	Ά			
Laboratory	/ Name:	Accutest Gulf Coast LRC Date:	12/	/12/2	012		
		Quarterly Well Sampling, Parker					
Project Na		County, Texas Laboratory Project Number:	+	2087			
Reviewer	Name:	Anita Patel Prep Batch Number(s):			VX16		
# ¹	A²	DESCRIPTION	YES	NO	NA	NR*	ER #5
R1	OI	CHAIN-OF-CUSTODY (C-O-C):					
		Did samples meet the laboratory's standard conditions of sample acceptability	X				
		upon receipt?	X				<del></del>
		Were all departures from standard conditions described in an exception report?	<u> </u>				
R2							
		Are all field sample ID numbers cross-referenced to the laboratory ID numbers?	X				<u> </u>
		Are all laboratory ID numbers cross-referenced to the corresponding QC data?	X				
R3	OI	Test reports					
		Were samples prepared and analyzed within holding times?  Other than those results <mql, all="" bracketed="" by="" calibration<="" other="" raw="" td="" values="" were=""><td>X</td><td></td><td></td><td></td><td><u> </u></td></mql,>	X				<u> </u>
		· · · · · · · · · · · · · · · · · · ·	Х				
		standards? Were calculations checked by a peer or supervisor?	X				<b>—</b>
		Were all analyte identifications checked by a peer or supervisor?	X				
		Were sample detection limits reported for all analytes not detected?	l ^				
		Were all results for soil and sediment samples reported on a dry weight basis?	+^		Х		
		Were % moisture (or solids) reported for all soil and sediment samples?	+		X		
		Were bulk soils/solids samples for volatile analysis extracted with methanol per					
		SW846 Method 5035?			Х		
	If required for the project, are TIC's reported?				Χ		
R4	0	Surrogate recovery data					
		Were surrogates added prior to extraction?					
		Were surrogate percent recoveries in all samples within the laboratory QC limits?	X				
R5	R5 OI Test reports/summary forms for blank samples						
		Were appropriate type(s) of blanks analyzed?	X				
		Were blanks analyzed at the appropriate frequency?	X				
	Were method blanks taken through the entire analytical process, including		X				
		preparation and, if applicable, cleanup procedures?  Were blank concentrations <mql?< td=""><td>X</td><td></td><td></td><td></td><td><b>-</b></td></mql?<>	X				<b>-</b>
R6	OI	Laboratory control samples (LCS):	<del>  ^</del>				
	<del>  0.</del>	Were all COCs included in the LCS?	Х				
		Was each LCS taken through the entire analytical procedure, including prep and					
		cleanup steps?	X				
		Were LCSs analyzed at required frequency?	X				
		Were LCS (and LCSD, if applicable) %Rs within the laboratory QC limits?	Х				
		Does the detectablility check sample data document the laboratory's capability to					-
		detect the COCs at the MDL used to calculate the SDLs?	X				5
		Was the LCSD RPD within QC limits?			Χ		
R7	OI	Matrix spike (MS) and matrix spike duplicate (MSD) data					
		Were the project/method specified analytes included in the MS and MSD?	X				
		Were MS/MSD analyzed at the appropriate frequency?	X	L.			
		Were MS (and MSD, if applicable) %Rs within the laboratory QC Limits?	<b> </b>	Х			4
	<del> </del>	Were the MS/MSD RPDs within laboratory QC limits?	X				
R8	OI	Analytical duplicate data	V				
		Were appropriate analytical duplicates analyzed for each matrix?	X				<u> </u>
		Were analytical duplicates analyzed at the appropriate frequency?  Were RPDs or relative standard deviations within the laboratory QC limits?	X				
R9	OI	Method quantitation limits (MQLs):	<del>  ^</del>				
1.3	0	Are the MQLs for each method analyte included in the laboratory data package?	X				
		Do the MQLs correspond to the concentration of the lowest non-zero calibration	<del>  ^</del>	$\vdash$			
	Are unadjusted MQLs and DCSs included in the laboratory data package?					2	
R10	OI	Other problems/anomalies					Ė
···•	<u> </u>	Are all known problems/anomalies/special conditions noted in this LRC and ER?	Х				
		Was applicable and available technology used to lower the SDL to minimize the	X				
		Is the laboratory NELAC-accredited under the Texas Laboratory Accreditation					
		Program for the analytes, matrices, and methods associated with this laboratory	X				3
		data package?					



Laboratory Name:		Accutest Gulf Coast LRC Date:				12/12/2012			
Project Na	me:	Quarterly Well Sampling, Parker Laboratory Project Number:		TC	TC20879				
Reviewer	Name:	Anita Patel Prep Batch Number(s):		GSS233, VX1673					
#1	A ²	DESCRIPTION		YES	NO	$NA^3$	NR⁴	ER#5	
S1	OI	Initial calibration (ICAL)							
		Were response factors and/or relative	e response factors for each analyte within QC	х					
		limits?		X					
		Were percent RSDs or correlation coefficient criteria met?							
			mended in the method used for all analytes?	Х					
			ne lowest and highest standard used to	X					
		calculate the curve?							
		Are ICAL data available for all instrum		Х					
			verified using an appropriate second source	Х					
		standard?			_				
S2	OI		erification (ICCV AND CCV) and continuing	V					
		Was the CCV analyzed at the method		X					
		Was the ICAL curve verified for each	alyte within the method-required QC limits?	X					
			e concentration in the inorganic CCB <mdl?< th=""><th></th><th></th><th>Х</th><th></th><th></th></mdl?<>			Х			
S3	0	Mass spectral tuning	e concentration in the morganic CCB <mdl?< th=""><th></th><th></th><th>^</th><th></th><th></th></mdl?<>			^			
		Was the appropriate compound for the	ne method used for tuning?	Х					
		Were ion abundance data within the		X					
S4	0	Internal standards (IS)	memod required QO illinio:						
	<b>├</b>		nes within the method-required QC limits?	Х					
S5	OI	Raw data (NELAC Section 5.5.10)							
	Ţ.	Were the raw data (for example, chromatograms, spectral data) reviewed by an							
		analyst?							
		Were data associated with manual integrations flagged on the raw data?							
S6	0	Dual column confirmation							
		Did dual column confirmation results			Х				
S7	0		Tentatively identified compounds (TICs):						
		If TICs were requested, were the mas	s spectra and TIC data subject to appropriate			Х			
		checks?				^			
S8	ı	Interference Check Sample (ICS) r							
		Were percent recoveries within meth-				Χ			
S9	ı		kes, and method of standard additions						
			, and the linearity within the QC limits			Х			
		specified in the method?			$\Box$				
S10	OI	Method detection limit (MDL) studi							
		Was a MDL study performed for each		X					
C44	OI	Is the MDL either adjusted or support	led by the analysis of DCSs?	X	_			5	
S11	OI OI	Proficiency test reports	ceptable on the applicable proficiency tests or				-		
		evaluation studies?	ceptable on the applicable proliciency tests of	Х					
S12	OI	Standards documentation							
	<del></del>		s NIST-traceable or obtained from other				1		
		appropriate source?	o mor traceable of obtained from other	Х					
S13	OI	Compound/analyte identification p	rocedures						
		Are the procedures for compound/ana		Х					
S14	OI	Demonstration of analyst compete	•						
		Was DOC conducted consistent with		Х					
		Is documentation of the analyst's com		Х					
S15	OI	Verification/validation documentat	ion for methods (NELAC Chapter 5)						
			the data documentated, verified, and	V					
L	<u></u>	validated, where applicable?		Х			]		
S16	OI	Laboratory standard operating pro							
		Are laboratory SOPs current and on file for each method performed?							



Laboratory		RATORY REVIEW CHEC Accutest Gulf Coast	LRC Date:	12/12/2012			
Project Na		Quarterly Well Sampling, Parker		TC20879			
Reviewer Name:		Anita Patel	Prep Batch Number(s):	GSS233, VX1673			
ER# ¹	Description						
1	blank. The	ing purposes, the MQL is defined in the SDL is defined in the report as the MI	DL. ,	•			
2	For reporting purposes, the method blank represents the unadjusted MQL. The DCS is on file in the laboratory and is not included in the laboratory data package.						
3	1	atory is NELAC-accredited under the T associated with this laboratory data pac	, ,				
4	All anoma	lies are discussed in the case narrative	<b>)</b> .				
5		atory does not perform DCS analysis for re values in the Texas TRRP PCL table		omponents reported are not listed o			

1ER# = Exception Report identification number (an Exception Report should be completed for an item if "NR" or "No" is checked on



# GC/MS Volatiles

QC Data Summaries

Includes the following where applicable:

- Method Blank Summaries
- Blank Spike Summaries
- Matrix Spike and Duplicate Summaries



**Method:** SW846 8260B

# Method Blank Summary Job Number: TC20879

PESTXST EarthCon Consultants **Account:** 

Quarterly Well Sampling, Parker County, Texas **Project:** 

Sample VX1673-MB	<b>File ID</b> X0087062.D	<b>DF</b>	<b>Analyzed</b> 12/06/12	<b>By</b> CF	Prep Date n/a	Prep Batch n/a	Analytical Batch VX1673

The QC reported here applies to the following samples:

CAS No.	Compound	Result	RL	MDL	Units Q
71-43-2	Benzene	ND	1.0	0.34	ug/l
100-41-4	Ethylbenzene	ND	1.0	0.32	ug/l
108-88-3	Toluene	ND	1.0	0.33	ug/l
1330-20-7	Xylene (total)	ND	3.0	0.87	ug/l

CAS No.	Surrogate Recoveries		Limits
1868-53-7	Dibromofluoromethane	105%	72-122%
17060-07-0	1,2-Dichloroethane-D4	95%	68-124%
2037-26-5	Toluene-D8	99%	80-119%
460-00-4	4-Bromofluorobenzene	98%	72-126%



**Method:** SW846 8260B

# Blank Spike Summary Job Number: TC20879

Account: PESTXST EarthCon Consultants

Quarterly Well Sampling, Parker County, Texas **Project:** 

Sample VX1673-BS	<b>File ID</b> X0087060. D	<b>DF</b> 1	<b>Analyzed</b> 12/06/12	<b>By</b> CF	<b>Prep Date</b> n/a	<b>Prep Batch</b> n/a	Analytical Batch VX1673

The QC reported here applies to the following samples:

CAS No.	Compound	Spike ug/l	BSP ug/l	BSP %	Limits
71-43-2	Benzene	25	22.2	89	68-119
100-41-4	Ethylbenzene	25	22.1	88	71-117
108-88-3	Toluene	25	22.4	90	73-119
1330-20-7	Xylene (total)	75	67.7	90	74-119

CAS No.	<b>Surrogate Recoveries</b>	BSP	Limits
17060-07-0	Dibromofluoromethane	101%	72-122%
	1,2-Dichloroethane-D4	99%	68-124%
	Toluene-D8	101%	80-119%
	4-Bromofluorobenzene	92%	72-126%



^{* =} Outside of Control Limits.

# 6.3.1

Page 1 of 1

**Method:** SW846 8260B

# Matrix Spike/Matrix Spike Duplicate Summary

Job Number: TC20879

**Account:** PESTXST EarthCon Consultants

**Project:** Quarterly Well Sampling, Parker County, Texas

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	<b>Analytical Batch</b>
TC20864-1MS	X0087064.D	1	12/06/12	CF	n/a	n/a	VX1673
TC20864-1MSD	X0087065.D	1	12/06/12	CF	n/a	n/a	VX1673
TC20864-1	X0087063.D	1	12/06/12	CF	n/a	n/a	VX1673

The QC reported here applies to the following samples:

CAS No.	Compound	TC20864-1 ug/l Q	Spike ug/l	MS ug/l	MS %	MSD ug/l	MSD %	RPD	Limits Rec/RPD
71-43-2	Benzene	1.0 U	25	23.0	92	22.4	90	3	68-119/12
100-41-4	Ethylbenzene	1.0 U	25	22.7	91	22.4	90	1	71-117/12
108-88-3	Toluene	1.0 U	25	22.9	92	22.5	90	2	73-119/13
1330-20-7	Xylene (total)	3.0 U	75	69.8	93	68.4	91	2	74-119/13

CAS No.	<b>Surrogate Recoveries</b>	MS	MSD	TC20864-1	Limits
1868-53-7	Dibromofluoromethane	103%	101%	105%	72-122%
17060-07-0	1,2-Dichloroethane-D4	98%	98%	96%	68-124%
2037-26-5	Toluene-D8	100%	100%	100%	80-119%
460-00-4	4-Bromofluorobenzene	91%	92%	98%	72-126%



^{* =} Outside of Control Limits.



# GC Volatiles

QC Data Summaries

Includes the following where applicable:

- Method Blank Summaries
- Blank Spike Summaries
- Matrix Spike and Duplicate Summaries



Method: RSKSOP-147/175

# Method Blank Summary Job Number: TC20879

PESTXST EarthCon Consultants **Account:** 

**Project:** Quarterly Well Sampling, Parker County, Texas

Sample GSS233-MB	<b>File ID</b> SS005056.D	<b>DF</b> 1	<b>Analyzed</b> 12/07/12	By LT	Prep Date n/a	<b>Prep Batch</b> n/a	Analytical Batch GSS233

The QC reported here applies to the following samples:

CAS No.	Compound	Result	RL	MDL	Units Q
74-82-8	Methane	ND	0.50	0.30	ug/l
74-85-1	Ethene	ND	1.0	0.50	ug/l
74-84-0	Ethane	ND	1.0	0.50	ug/l
74-98-6	Propane	ND	1.5	0.75	ug/l
75-28-5	Isobutane	ND	1.5	0.75	ug/l
106-97-8	Butane	ND	1.5	0.75	ug/l

Method: RSKSOP-147/175

# Blank Spike Summary Job Number: TC20879

Account: PESTXST EarthCon Consultants

Quarterly Well Sampling, Parker County, Texas **Project:** 

Sample GSS233-BS	<b>File ID</b> SS005054.D	<b>DF</b> 1	<b>Analyzed</b> 12/07/12	By LT	Prep Date n/a	Prep Batch n/a	Analytical Batch GSS233

The QC reported here applies to the following samples:

CAS No.	Compound	Spike ug/l	BSP ug/l	BSP %	Limits
74-82-8	Methane	21.5	16.2	75	68-139
74-85-1	Ethene	57.4	43.2	75	52-145
74-84-0	Ethane	43.3	47.1	109	68-131
74-98-6	Propane	60.6	60.5	100	69-131
75-28-5	Isobutane	72.5	70.4	97	72-131
106-97-8	Butane	76.6	73.6	96	66-128



^{* =} Outside of Control Limits.

Method: RSKSOP-147/175

# **Matrix Spike Summary**

Job Number: TC20879

PESTXST EarthCon Consultants Account:

Project: Quarterly Well Sampling, Parker County, Texas

Sample	<b>File ID</b>	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
TC20970-2MS ^a	SS005067.D	12/07/12	LT	n/a	n/a	GSS233
TC20970-2 ^a	SS005066.D	12/07/12	LT	n/a	n/a	GSS233

The QC reported here applies to the following samples:

CAS No.	Compound	TC20970-2 ug/l Q	Spike ug/l	MS ug/l	MS %	Limits
74-82-8	Methane	105	21.5	95.8	-42* b	68-139
74-85-1	Ethene	ND	57.4	46.6	81	52-145
74-84-0	Ethane	4.71	43.3	46.7	97	68-131
74-98-6	Propane	ND	60.6	53.4	88	69-131
75-28-5	Isobutane	ND	72.5	61.8	85	72-131
106-97-8	Butane	ND	76.6	66.0	86	66-128

⁽a) Sample was not preserved to a pH < 2.



⁽b) Outside control limits due to high level in sample relative to spike amount.

^{* =} Outside of Control Limits.

Method: RSKSOP-147/175

# **Duplicate Summary Job Number:** TC20879

PESTXST EarthCon Consultants Account:

**Project:** Quarterly Well Sampling, Parker County, Texas

Sample TC20879-1DUP TC20879-1	File ID SS005062.D SS005061.D	<b>Analyzed</b> 12/07/12 12/07/12	By LT LT	Prep Date n/a n/a	Prep Batch n/a n/a	Analytical Batch GSS233 GSS233

The QC reported here applies to the following samples:

CAS No.	Compound	TC20879-1 ug/l Q	DUP ug/l Q	RPD	Limits
74-82-8	Methane	4.10	3.34	20	53
74-85-1	Ethene	1.0 U	ND	nc	27
74-84-0	Ethane	1.0 U	ND	nc	43
74-98-6	Propane	1.5 U	ND	nc	21
75-28-5	Isobutane	1.5 U	ND	nc	35
106-97-8	Butane	1.5 U	ND	nc	33



^{* =} Outside of Control Limits.



## ANALYSIS REPORT

Lab #: 321081 Job #: 20030

Sample Name/Number: WW21-Van-113012 Company: Oil Tracers, LLC

Date Sampled: 11/30/2012

Container: Dissolved Gas Bottle

Field/Site Name: Third Quarter Well Sampling

Location: Parker County, Texas

Formation/Depth:

Sampling Point:

Date Received: 12/05/2012 Date Reported: 2/01/2013

Component	Chemical	$\delta^{13}$ C	$\delta D$	$\delta^{18}$ O
and the second	mol. %	‰	%	%。
Carbon Monoxide	nd			
Hydrogen Sulfide	na			
Helium	na			
Hydrogen	nd			
Argon	1.65			
Oxygen	14.28			
Nitrogen	82.78			
Carbon Dioxide	1.24			
Methane	0.0546			
Ethane	nd			
Ethylene	nd			
Propane	nd			
Propylene	nd			
Iso-butane	nd			
N-butane	nd			
Iso-pentane	nd			
N-pentane	nd			
Hexanes +	nd			

### Remarks:

Analysis is of gas extracted from water by headspace equilibration. Analysis has been corrected for helium added to create headspace. Helium dilution factor = 0.78

nd = not detected. na = not analyzed. Isotopic composition of hydrogen is relative to VSMOW. Isotopic composition of carbon is relative to VPDB. Isotopic composition of oxygen is relative to VSMOW, except for carbon dioxide which is relative to VPDB. Calculations for BTU and specific gravity per ASTM D3588. Chemical compositions are normalized to 100%. Mol. % is approximately equal to vol. %.

^{*}Addition of helium negates the ability to detect native helium and may negate the ability to detect hydrogen.



12/12/12



# Technical Report for

EarthCon Consultants

Quarterly Well Sampling, Parker County, Texas

3rd Quarter / WW1-Wel

Accutest Job Number: TC20872

Sampling Date: 11/30/12

## Report to:

EarthCon Consultants 4800 Sugar Grove Suite 420 Stafford, TX 77477

gfloreslovo@earthcon.com; djackson@jacksonsjoberg.com; mcpatton@rangeresources.com; escott@earthcon.com

ATTN: Gabriela Floreslovo

Total number of pages in report: 26



Test results contained within this data package meet the requirements of the National Environmental Laboratory Accreditation Conference and/or state specific certification programs as applicable.

Richard Rollriguez Laboratory Director

Client Service contact: Elessa Sommers 713-271-4700

Certifications: TX (T104704220-12-8) AR (11-028-0) AZ (AZ0769) FL (E87628) KS (E-10366) LA (85695/04004) OK (211-035)

This report shall not be reproduced, except in its entirety, without the written approval of Accutest Laboratories. Test results relate only to samples analyzed.

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# **Sample Summary**

EarthCon Consultants

Job No: TC20872

Quarterly Well Sampling, Parker County, Texas Project No: 3rd Quarter / WW1-Wel

Sample	Collected		Matrix		ix	Client	
Number	Date	Time By	Received	Code	Type	Sample ID	
TC20872-1	11/30/12	08:40	12/04/12	AQ	Ground Water	WW1-WEL-113012	





### SAMPLE DELIVERY GROUP CASE NARRATIVE

Client: EarthCon Consultants Job No TC20872

Site: Quarterly Well Sampling, Parker County, Texas Report Date 12/12/2012 12:07:19 P

1 Sample was collected on 11/30/2012 and received intact at Accutest on 12/04/2012 and properly preserved in 1 cooler at 2.4 Deg C. The sample received an Accutest job number of TC20872. A listing of the Laboratory Sample ID, Client Sample ID and date of collection are presented in the Results Summary Section of this report.

Except as noted below, all method specified calibrations and quality control performance criteria were met for this job. For more information, please refer to QC summary pages.

### Volatiles by GCMS By Method SW846 8260B

Matrix AQ Batch ID: VX1673

- All samples were analyzed within the recommended method holding time.
- All method blanks for this batch meet method specific criteria.
- Sample(s) TC20864-1MS, TC20864-1MSD were used as the QC samples indicated.

### Volatiles by GC By Method RSKSOP-147/175

Matrix AQ Batch ID: GSS232

- All samples were analyzed within the recommended method holding time.
- All method blanks for this batch meet method specific criteria.
- Sample(s) TC20890-1DUP, TC20890-1MS were used as the QC samples indicated.
- Matrix Spike Recovery(s) for Ethene, Propane are outside control limits. Probable cause due to matrix interference.
- Matrix Spike Recovery(s) for Ethane, Methane are outside control limits. Outside control limits due to high level in sample relative to spike amount.
- RPD(s) for Duplicate for Butane, Isobutane, Propane are outside control limits for sample TC20890-1DUP.

Accutest Laboratories Gulf Coast (ALGC) certifies that this report meets the project requirements for analytical data produced for the samples as received at ALGC and as stated on the COC. ALGC certifies that the data meets the Data QualityObjectives for precision, accuracy and completeness as specified in the ALGC Quality Manual except as noted above. This report is to be used in its entirety. ALGC is not responsible for any assumptions of data quality if partial data packages are used



# **Summary of Hits Job Number:** TC20872

Account: EarthCon Consultants

Quarterly Well Sampling, Parker County, Texas 11/30/12**Project:** 

Collected:

Lab Sample ID Analyte	Client Sample ID	Result/ Qual	MQL	SDL	Units	Method
TC20872-1	WW1-WEL-113012					
Methane Ethane		2.12 0.234	0.0050 0.0010	0.0030 0.00050	mg/l mg/l	RSKSOP-147/175 RSKSOP-147/175





Sample Results	
Report of Analysis	



# **Report of Analysis**

Client Sample ID: WW1-WEL-113012

 Lab Sample ID:
 TC20872-1
 Date Sampled:
 11/30/12

 Matrix:
 AQ - Ground Water
 Date Received:
 12/04/12

 Method:
 SW846 8260B
 Percent Solids:
 n/a

**Project:** Quarterly Well Sampling, Parker County, Texas

	File ID	DF	Analyzed	By	<b>Prep Date</b>	Prep Batch	Analytical Batch
Run #1	X0087069.D	1	12/06/12	CF	n/a	n/a	VX1673
Run #2							

	Purge Volume	
Run #1	5.0 ml	
Run #2		

### **Purgeable Aromatics**

CAS No.	Compound	Result	MQL	SDL	Units	Q
71-43-2 108-88-3 100-41-4 1330-20-7	Benzene Toluene Ethylbenzene Xylene (total)	0.00034 U 0.00033 U 0.00032 U 0.00087 U	0.0010 0.0010 0.0010 0.0030	0.00034 0.00033 0.00032 0.00087	mg/l mg/l mg/l mg/l	
CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits		
1868-53-7 17060-07-0 2037-26-5 460-00-4	Dibromofluoromethane 1,2-Dichloroethane-D4 Toluene-D8 4-Bromofluorobenzene	105% 97% 100% 98%		72-122% 68-124% 80-119% 72-126%		

 $\begin{array}{ll} U = & Not \; detected & SDL \; - \; Sample \; Detection \; Limit \\ MQL = & Method \; Quantitation \; Limit \\ \end{array}$ 

E = Indicates value exceeds calibration range

J = Indicates an estimated value

B = Indicates analyte found in associated method blank N = Indicates presumptive evidence of a compound



## 4

# **Report of Analysis**

Client Sample ID: WW1-WEL-113012

 Lab Sample ID:
 TC20872-1
 Date Sampled:
 11/30/12

 Matrix:
 AQ - Ground Water
 Date Received:
 12/04/12

 Method:
 RSKSOP-147/175
 Percent Solids:
 n/a

**Project:** Quarterly Well Sampling, Parker County, Texas

	File ID	DF	Analyzed	By	<b>Prep Date</b>	Prep Batch	Analytical Batch
Run #1	SS005035.D	1	12/06/12	LT	n/a	n/a	GSS232
Run #2	SS005037.D	10	12/06/12	LT	n/a	n/a	GSS232

### **RSK147 Special List**

CAS No.	Compound	Result	MQL	SDL	Units	Q
74-82-8	Methane	2.12 a	0.0050	0.0030	mg/l	
74-85-1	Ethene	0.00050 U	0.0010	0.00050	mg/l	
74-84-0	Ethane	0.234	0.0010	0.00050	mg/l	
74-98-6	Propane	0.00075 U	0.0015	0.00075	mg/l	
75-28-5	Isobutane	0.00075 U	0.0015	0.00075	mg/l	
106-97-8	Butane	0.00075 U	0.0015	0.00075	mg/l	

(a) Result is from Run# 2

U = Not detected

SDL - Sample Detection Limit

MQL = Method Quantitation Limit

E = Indicates value exceeds calibration range

J = Indicates an estimated value

B = Indicates analyte found in associated method blank N = Indicates presumptive evidence of a compound





Misc. Forms

Custody Documents and Other Forms

Includes the following where applicable:

- Chain of Custody
- LRC Form



### OF CUSTODY

	<b>CHAIN</b>	(
ACCUITEST.		

			CHAI	IN (	OF (	CU	ST	ΟI	ΟY												РА	GE		OF <u>/</u>
Laboratories			10165 Hs	unvin De	Ste 150 H	ouston	TV 7	7026						FED-EX	K Trackir	ng #				Bottle C	order Con	trol#		
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afford TX 77477			Siate	Compa	ny Name										ä			1						SW - Surface Wa SO - Soil
piect Contact E-mail	Project #			Stroot	Address										Į.				1					SL- Sludge
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one# Fax#	Client Purchase	Order#		City				61	ate			Zip			e,			l						LIQ - Other Liqui
1-201-3513				"				٠.	010			zip			the 175									AIR - Air SOL - Other Soli
mpler(s) Name(s) Phone #	Project Manage	r		Attentio	ın:										유									WP - Wipe FB-Field Blank
Bruskewitz									ω.	ᄪ			ŀ						ro-rield blank					
		Coll	lection			_		Number	of pre	served i	Bottles			8260B	声									
utest					Τ	T	공	П	П	£ .	$\overline{}$	T	1	× 8	ne,									
Field ID / Point of Collection	Date	Time	Sampled By	Matrix	# of bottles	후	ZANa	HN03	NONE	DI Wat	25	NaHSO4 ENCORE	OTHE	втех	Butane, Ethane, E Propane by RSK-	1								1
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X Standard	Approved By (Accu		MARINES EL VIII		Commerc			elivera	ible I				- 8						Comr	nents /	Special	Instruc	tions	
5 Day RUSH					Commerc		-			_	TRE	KP D For												
4 Day RUSH					FULT1 (1			ei 2)		-	] Cth		mat											
3 Day RUSH					REDT1 (					_	J 0			_										
2 Day RUSH					Commerc	ial "C'																		
1 Day EMERGENCY		<u> </u>				C	ommer	rcial "A'	" = Re	sults (	Only													
Emergency & Rush T/A data available VIA Lablink	. 097	2 P				C	ommer	rcial "B'	" = Re	sults +	QC:	Summ	агу											
17-9	-12 Sai	nple Custody m	ust be docum	ented b	elow each	C:	ommer	rcial "C	" = Re	sults -	+ QC	& Sun	ogate	Summ	nary					OK LOWED				
Date Time:	/	Received By:		onted Di	CIOW CALI	i tiirle	nise :	Pies c Relinqui	nang Ished	e pos sv:	sess	ion, i	ncluc	ung co	ourier		). Date Tim							
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elinquished by Sampler: Date Time:		Received By:				$\overline{}$	F	Relinqui	ished I	Ву:							ate Tim	۵٠	-	Received	P			
elinquished by: Date Time:		3			#		- 4	4								· '				4	Ly:			
Date Time:		Received By:					ļ	Custody	Seal	1				itact		Preserve	1 where	applicat	ole			On Ice	Co	ooler Temp.

TC20872: Chain of Custody Page 1 of 4





### **Accutest Laboratories Sample Receipt Summary**

Accutest Job Number: To	C20872	2		Client:	EARTHCON CONSULTANTS		Project:	3RD QTR WEL	L SAMPLI	NG,F	ARKE	R COUNTY,T		
Date / Time Received: 12	2/4/201	2			Delivery I	Method	:	Client	Airbill #'s:					
No. Coolers: 1	TI	nerm	ID: IR	16					Temp Adjus	tment Factor:	0.2			
Cooler Temps (Initial/Adju	usted):	<u>#1:</u>	(2.2/2.4	<u>4)</u>				_						
Cooler Security	Y or	N				Υo	or N	Sample Inte	grity - Docume	ntation	<u>Y</u>	or	N	
1. Custody Seals Present:	✓		3.	COC Pre	esent:	$\checkmark$		Sample lab	els present on bo	ttles:	<b>✓</b>			
2. Custody Seals Intact:	✓		4. Sn	npl Dates	s/Time OK	$\checkmark$			abeling complete:		<b>✓</b>			
Cooler Temperature		Υo	r N					3. Sample cor	ntainer label / CO	C agree:	<b>✓</b>			
Temp criteria achieved:	'-	<b>V</b>						Sample Inte	egrity - Condition	on	Υ_	or	N	
2. Cooler temp verification:		Infar	ed Gun					1. Sample red			<b>✓</b>			
3. Cooler media:		Ice	(bag)						ers accounted for:		✓			
Quality Control Preservat	tion	ΥÓ	or N	N/A		WTB	STB	3. Condition of	of sample:			Intac	_	
1. Trip Blank present / cooler	r:	<b>V</b>				<b>V</b>		Sample Inte	grity - Instructi	ons	Υ	or	N	N/A
2. Trip Blank listed on COC:			<b>~</b>						equested is clear:		<u> </u>		П	
3. Samples preserved proper	rly:	<b>V</b>						,	ceived for unspeci				✓	
4. VOCs headspace free:		<b>v</b>	П					3. Sufficient	volume recvd for a	analysis:	<b>~</b>			
		_	_						ng instructions cle					<b>✓</b>
								5. Filtering in	structions clear:					<b>✓</b>
Comments -Received trip bl	lank not	listed	on CO	C.										

TC20872: Chain of Custody Page 2 of 4

Page 1 of 3







#### **Problem Resolution**

Accutest Job Number: TC20872

CSR: Elessa Sommers Response Date: 12/4/2012

Response: Trip blank is on separate report.

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TC20872: Chain of Custody Page 3 of 4







### Sample Receipt Log

 Job #:
 TC20872
 Date / Time Received:
 12/4/2012 9:22:00 AM
 Initials:
 CH

Client: EARTHCON CONSULTANTS

Cooler #	Sample ID:	Vol	Bot #	Location	Pres	рН	Therm ID	Initial Temp	Therm CF	Corrected Temp
1	TC20872-1	40ml	1	VR	HCL	Note #1 - Preservative to be checked by analyst at the instrument.	IR6	2.2	0.2	2.4
1	TC20872-1	40ml	2	VR	HCL	Note #1 - Preservative to be checked by analyst at the instrument.	IR6	2.2	0.2	2.4
1	TC20872-1	40ml	3	VR	HCL	Note #1 - Preservative to be checked by analyst at the instrument.	IR6	2.2	0.2	2.4
1	TC20872-1	40ml	4	VR	HCL	Note #1 - Preservative to be checked by analyst at the instrument.	IR6	2.2	0.2	2.4
1	TC20872-1	40ml	5	VR	HCL	Note #1 - Preservative to be checked by analyst at the instrument.	IR6	2.2	0.2	2.4
1	TC20872-1	40ml	6	VR	HCL	Note #1 - Preservative to be checked by analyst at the instrument	IR6	2.2	0.2	2.4

TC20872: Chain of Custody

Page 4 of 4



## Appendix A Laboratory Data Package Cover Page

This signature page, the laboratory review checklist, and the following reportable data:

TC20872 This data package consists of

[]

Richard Rodriguez

Ļ	RT	Field chain-of-custody documenta	ation;	
	R2	Sample identification cross-refere	nce;	
	R3	Test reports (analytical data sheet	ts) for each environmental sampl	e that includes:
		a)	Items consistent with NELAC	C 5.13 or ISO/IEC 17025 Section 5.10
		b)	dilution factors,	
		c)	preparation methods,	
		d)	cleanup methods, and	
		e)	if required for the project, ter	ntatively identified compounds (TICs).
	R4	Surrogate recovery data including	<b>)</b> :	,
		a)	Calculated recovery (%R), a	ind
		b)	The laboratory's surrogate C	QC limits.
	R5	Test reports/summary forms for bl	lank samples;	
	R6	Test reports/summary forms for la	aboratory control samples (LCSs)	including:
•		a)	LCS spiking amounts,	•
		b)	Calculated %R for each ana	lyte, and
		c)	The laboratory's LCS QC lin	•
	R7	Test reports for project matrix spik	-	
•		a)	Samples associated with the	, ,
		b)	MS/MSD spiking amounts,	,
		c)		ISD analyte measured in the parent and
		ď)		e percent differences (RPDs), and
		e)	The laboratory's MS/MSD Q	
į.	R8	Laboratory analytical duplicate (if	-	
•		a)	The amount of analyte meas	
		b)	The calculated RPD, and	,
		c)	The laboratory's QC limits for	or analytical duplicates.
Ū.	R9	List of method quantitation limits (	-	ample results for each analyte for each
	R10	Other problems or anomalies.	,	
•		, , , , , , , , , , , , , , , , , , , ,		
The Exce	ption Report	for each "No" or "Not Reviewed (N	R)" item in Laboratory Review C	hecklist and for each analyte, matrix, and
		laboratory does not hold NELAC ac		
		,		,
				nis laboratory is NELAC accredited under the
				ted in this data package except as noted in
the Excep	tion Report.	This data package has been review	wed by the laboratory and is com	plete and technically compliant with the
				exception reports. By my signature below, I
affirm to the	ne best of m	y knowledge, all problems/anomalie	es, observed by the laboratory as	s having the potential to affect the quality of
the data, I	nave been id	lentified by the laboratory in the Lat	boratory Review Checklist, and r	o information or data have been knowingly
withheld.				
Chook if	annliaahla	This laboratory meets an exception	on under 30 TAC 825 6 and was I	act increation by
[]	аррисавіе.			
[]				e data in this laboratory data package are
				er page of the report in which these data are
			this data package and is by signa	ature affirming the above release statement
		is true.		
QA Mana	_			
Name (Pr	inted)	Signature	Official Title (printed)	Date

Laboratory Director

Date 12/12/2012



	ı	ABORATORY REVIEW	HECKLIST: REPORTABLE	DΔT	Δ				
Laboratory		Accutest Gulf Coast	LRC Date:	12/12/2012					
Laboratory	ivanio.	Quarterly Well Sampling, Parker		12	12/2	012			
Project Na	me:	County, Texas	Laboratory Project Number:	тс	2087	72			
Reviewer	Name:	Anita Patel	Prep Batch Number(s):	_		VX16	373		
#1	A ²	DESCRIPTION	Trop Edicit Hambor(o).					ER #5	
R1	OI	CHAIN-OF-CUSTODY (C-O-C):							
			andard conditions of sample acceptability						
		upon receipt?	, , ,	X					
		Were all departures from standard co	onditions described in an exception report?	Х					
R2	OI	Sample and quality control (QC) id	lentification						
		Are all field sample ID numbers cross	s-referenced to the laboratory ID numbers?	Х					
		Are all laboratory ID numbers cross-r	eferenced to the corresponding QC data?	Х					
R3	OI	Test reports	·						
		Were samples prepared and analyze	ed within holding times?	Х					
			all other raw values bracketed by calibration						
		standards?	,	X					
		Were calculations checked by a peer	or supervisor?	Х					
		Were all analyte identifications check	ked by a peer or supervisor?	Х					
		Were sample detection limits reporte		Х					
			t samples reported on a dry weight basis?			Х			
		Were % moisture (or solids) reported				Х			
			ere bulk soils/solids samples for volatile analysis extracted with methanol per						
		SW846 Method 5035?	. 10	-		Х			
		If required for the project, are TIC's re	eported?			Х			
R4	0	Surrogate recovery data	-4	V		_			
		Were surrogates added prior to extra	all samples within the laboratory QC limits?	X					
R5	OI	Test reports/summary forms for bl	· · · · · · · · · · · · · · · · · · ·	<del>  ^</del>					
- 67	0	Were appropriate type(s) of blanks a		Х					
	Were blanks analyzed at the appropriate frequency?  Were method blanks taken through the entire analytical process, including			X					
				^					
		preparation and, if applicable, cleanup procedures?							
		Were blank concentrations <mql?< td=""><td>p procedures.</td><td>l x</td><td></td><td></td><td></td><td></td></mql?<>	p procedures.	l x					
R6	OI	Laboratory control samples (LCS)	:						
		Were all COCs included in the LCS?		Х				l .	
		Was each LCS taken through the ent	tire analytical procedure, including prep and						
		cleanup steps?		X					
		Were LCSs analyzed at required free	quency?	Х					
		Were LCS (and LCSD, if applicable)	%Rs within the laboratory QC limits?	Х					
			data document the laboratory's capability to	X				5	
		detect the COCs at the MDL used to		^				Ů	
		Was the LCSD RPD within QC limits				X			
R7	OI	Matrix spike (MS) and matrix spike		V					
			nalytes included in the MS and MSD?	X		<u> </u>	-		
		Were MS/MSD analyzed at the approver Were MS (and MSD, if applicable) %		X	Х	<u> </u>	<u> </u>	4	
		Were the MS/MSD RPDs within labor		X	<del>  ^</del>		<del>                                     </del>	-	
R8	OI	Analytical duplicate data	ratory see minus:	<u> </u>					
	- 01	Were appropriate analytical duplicate	es analyzed for each matrix?	X				ı	
		Were analytical duplicates analyzed	,	l x	$\vdash$	<b>-</b>	<del>                                     </del>		
	Were RPDs or relative standard deviations within the laboratory QC limits?							4	
R9	OI Method quantitation limits (MQLs):							_	
···•	<u> </u>		te included in the laboratory data package?	Х				I	
			entration of the lowest non-zero calibration	X					
		· · · · · · · · · · · · · · · · · · ·	luded in the laboratory data package?		Х			2	
R10	OI	Other problems/anomalies							
		Are all known problems/anomalies/special conditions noted in this LRC and ER?							
	Was applicable and available technology used to lower the SDL to minimize the								
	Is the laboratory NELAC-accredited under the Texas Laboratory Accreditation								
	Program for the analytes, matrices, and methods associated with this laboratory						l	3	
		data package?		<u></u>	L	L_	L_	<u> </u>	



Laboratory	Name:	Accutest Gulf Coast	LRC Date:	12/	12/2	012		
Project Na	me:	Quarterly Well Sampling, Parker	Laboratory Project Number:	TC	2087	'2		
Reviewer	Name:	Anita Patel	Prep Batch Number(s):	GSS	232,	VX16	73	
#1	A ²	DESCRIPTION		YES	NO	$NA^3$	NR⁴	ER#5
S1	OI	Initial calibration (ICAL)						
		· ·	e response factors for each analyte within QC	x				
		limits?						
		Were percent RSDs or correlation co		Х				
			mended in the method used for all analytes?	Х				
			ne lowest and highest standard used to	х				
		calculate the curve?	ponto upod?					
		Are ICAL data available for all instrum	verified using an appropriate second source	Х				
		standard?	verified using an appropriate second source	Х				
S2	OI		erification (ICCV AND CCV) and continuing					
- 32	01	Was the CCV analyzed at the method		Х				
			alyte within the method-required QC limits?	X				
		Was the ICAL curve verified for each		X				
			e concentration in the inorganic CCB <mdl?< th=""><th></th><th></th><th>Х</th><th></th><th></th></mdl?<>			Х		
S3	0	Mass spectral tuning						
		Was the appropriate compound for th	ne method used for tuning?	Х				
		Were ion abundance data within the	method-required QC limits?	Х				
S4	0	Internal standards (IS)	•					
		Were IS area counts and retention tin	nes within the method-required QC limits?	Х				
S5	OI	Raw data (NELAC Section 5.5.10)						
		Were the raw data (for example, chro	matograms, spectral data) reviewed by an	х				
		analyst?						
		Were data associated with manual in	tegrations flagged on the raw data?	Χ				
S6	0	Dual column confirmation					_	
		Did dual column confirmation results			Χ			
S7	0	Tentatively identified compounds (						
		checks?	s spectra and TIC data subject to appropriate			Χ		
S8	1	Interference Check Sample (ICS) r	osults					
	'	Were percent recoveries within metho				Х		
S9	1		kes, and method of standard additions					
			, and the linearity within the QC limits					
		specified in the method?	,			Х		
S10	OI	Method detection limit (MDL) studi	es					
		Was a MDL study performed for each	reported analyte?	Х				
		Is the MDL either adjusted or support	ed by the analysis of DCSs?	Х				5
S11	OI	Proficiency test reports						
			ceptable on the applicable proficiency tests or	x				
		evaluation studies?						
S12	OI	Standards documentation	NOT:					
		1	s NIST-traceable or obtained from other	х				
	01	appropriate source?						
S13	OI	Compound/analyte identification p		Х				
S14	OI	Are the procedures for compound/analyte identification documented?						
	- Ji	Demonstration of analyst competency (DOC) Was DOC conducted consistent with NELAC Chapter 5?						
		Is documentation of the analyst's competency up-to-date and on file?						
S15	OI	Verification/validation documentation for methods (NELAC Chapter 5)						
	<u> </u>	Are all the methods used to generate the data documentated, verified, and						
		validated, where applicable?						
S16	OI	Laboratory standard operating procedures (SOPs)						
		Are laboratory SOPs current and on f		Х				



LABORATORY REVIEW CHECKLIST (continued): Exception Reports													
Laboratory	Name:	Accutest Gulf Coast	LRC Date:	12/12/2012									
Project Na	me:	Quarterly Well Sampling, Parker	Laboratory Project Number:	TC20872									
Reviewer	Name:	Anita Patel	Prep Batch Number(s):	GSS232, VX1673									
ER# ¹	Description	n		•									
1	. Starra The est to demice in the repert do the install												
2	For reporting purposes, the method blank represents the unadjusted MQL. The DCS is on file in the laboratory and is not included in the laboratory data package.												
3	1	,	exas Laboratory Accreditation Program for the kage for analytes that are listed in the Texas F										
4	All anomal	es are discussed in the case narrative	).										
5	1	tory does not perform DCS analysis for e values in the Texas TRRP PCL table	or Method RSKSOP-147/175. The component es.	s reported are not listed or									

¹ER# = Exception Report identification number (an Exception Report should be completed for an item if "NR" or "No" is checked on



## GC/MS Volatiles

QC Data Summaries

Includes the following where applicable:

- Method Blank Summaries
- Blank Spike Summaries
- Matrix Spike and Duplicate Summaries



**Method:** SW846 8260B

# Method Blank Summary Job Number: TC20872

PESTXST EarthCon Consultants **Account:** 

**Project:** Quarterly Well Sampling, Parker County, Texas

Sample VX1673-MB	<b>File ID</b> X0087062.D	<b>DF</b> 1	<b>Analyzed</b> 12/06/12	<b>By</b> CF	Prep Date n/a	Prep Batch n/a	Analytical Batch VX1673

The QC reported here applies to the following samples:

CAS No.	Compound	Result	RL	MDL	Units Q
71-43-2	Benzene	ND	1.0	0.34	ug/l
100-41-4	Ethylbenzene	ND	1.0	0.32	ug/l
108-88-3	Toluene	ND	1.0	0.33	ug/l
1330-20-7	Xylene (total)	ND	3.0	0.87	ug/l

CAS No.	<b>Surrogate Recoveries</b>		Limits
1868-53-7	Dibromofluoromethane	105%	72-122%
17060-07-0	1,2-Dichloroethane-D4	95%	68-124%
2037-26-5	Toluene-D8	99%	80-119%
460-00-4	4-Bromofluorobenzene	98%	72-126%



**Method:** SW846 8260B

## Blank Spike Summary Job Number: TC20872

PESTXST EarthCon Consultants Account:

Quarterly Well Sampling, Parker County, Texas **Project:** 

Sample VX1673-BS	<b>File ID</b> X0087060.D	<b>DF</b> 1	<b>Analyzed</b> 12/06/12	By CF	Prep Date n/a	Prep Batch n/a	Analytical Batch VX1673

The QC reported here applies to the following samples:

CAS No.	Compound	Spike ug/l	BSP ug/l	BSP %	Limits
71-43-2	Benzene	25	22.2	89	68-119
100-41-4	Ethylbenzene	25	22.1	88	71-117
108-88-3	Toluene	25	22.4	90	73-119
1330-20-7	Xylene (total)	75	67.7	90	74-119

CAS No.	<b>Surrogate Recoveries</b>	BSP	Limits	
	Dibromofluoromethane	101%	72-122%	
17060-07-0	1,2-Dichloroethane-D4	99%	68-124%	
2037-26-5	Toluene-D8	101%	80-119%	
460-00-4	4-Bromofluorobenzene	92%	72-126%	



^{* =} Outside of Control Limits.

## 6.3.1

Page 1 of 1

**Method:** SW846 8260B

### σ

## Matrix Spike/Matrix Spike Duplicate Summary

Job Number: TC20872

**Account:** PESTXST EarthCon Consultants

**Project:** Quarterly Well Sampling, Parker County, Texas

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
TC20864-1MS	X0087064.D	1	12/06/12	CF	n/a	n/a	VX1673
TC20864-1MSD	X0087065.D	1	12/06/12	CF	n/a	n/a	VX1673
TC20864-1	X0087063.D	1	12/06/12	CF	n/a	n/a	VX1673

The QC reported here applies to the following samples:

CAS No.	Compound	TC20864-1 ug/l Q	Spike ug/l	MS ug/l	MS %	MSD ug/l	MSD %	RPD	Limits Rec/RPD
71-43-2	Benzene	1.0 U	25	23.0	92	22.4	90	3	68-119/12
100-41-4	Ethylbenzene	1.0 U	25	22.7	91	22.4	90	1	71-117/12
108-88-3	Toluene	1.0 U	25	22.9	92	22.5	90	2	73-119/13
1330-20-7	Xylene (total)	3.0 U	75	69.8	93	68.4	91	2	74-119/13

CAS No.	<b>Surrogate Recoveries</b>	MS MSD		TC20864-1	Limits
1868-53-7	Dibromofluoromethane	103%	101%	105%	72-122%
17060-07-0	1,2-Dichloroethane-D4	98%	98%	96%	68-124%
2037-26-5	Toluene-D8	100%	100%	100%	80-119%
460-00-4	4-Bromofluorobenzene	91%	92%	98%	72-126%

^{* =} Outside of Control Limits.



## GC Volatiles

## QC Data Summaries

### Includes the following where applicable:

- Method Blank Summaries
- Blank Spike Summaries
- Matrix Spike and Duplicate Summaries



Method: RSKSOP-147/175

# Method Blank Summary Job Number: TC20872

Job Number:

PESTXST EarthCon Consultants **Account:** 

**Project:** Quarterly Well Sampling, Parker County, Texas

Sample GSS232-MB	File ID SS005026.D	<b>DF</b> 1	<b>Analyzed</b> 12/06/12	By LT	Prep Date n/a	Prep Batch n/a	Analytical Batch GSS232

The QC reported here applies to the following samples:

CAS No.	Compound	Result	RL	MDL	Units Q
74-82-8	Methane	ND	0.50	0.30	ug/l
74-85-1	Ethene	ND	1.0	0.50	ug/l
74-84-0	Ethane	ND	1.0	0.50	ug/l
74-98-6	Propane	ND	1.5	0.75	ug/l
75-28-5	Isobutane	ND	1.5	0.75	ug/l
106-97-8	Butane	ND	1.5	0.75	ug/l



Method: RSKSOP-147/175

## Blank Spike Summary Job Number: TC20872

Account: PESTXST EarthCon Consultants

Quarterly Well Sampling, Parker County, Texas **Project:** 

Sample GSS232-BS	File ID SS005023.D	<b>DF</b> 1	<b>Analyzed</b> 12/06/12	By LT	Prep Date n/a	Prep Batch n/a	Analytical Batch GSS232

The QC reported here applies to the following samples:

CAS No.	Compound		Spike ug/l	BSP ug/l	BSP %	Limits
74-82-8	Methane	2	21.5	21.0	98	68-139
74-85-1	Ethene	4	57.4	54.7	95	52-145
74-84-0	Ethane	4	43.3	56.7	131	68-131
74-98-6	Propane	(	60.6	68.2	113	69-131
75-28-5	Isobutane	7	72.5	77.3	107	72-131
106-97-8	Butane	<b>2</b>	76.6	82.4	108	66-128



^{* =} Outside of Control Limits.

Method: RSKSOP-147/175

## **Matrix Spike Summary**

Job Number: TC20872

PESTXST EarthCon Consultants Account:

Quarterly Well Sampling, Parker County, Texas Project:

Sample TC20890-1MS TC20890-1 TC20890-1	File ID SS005029.D SS005027.D SS005030.D	1	Analyzed 12/06/12 12/06/12 12/06/12	By LT LT LT	Prep Date n/a n/a n/a	Prep Batch n/a n/a n/a	Analytical Batch GSS232 GSS232 GSS232
TC20890-1	SS005030.D	250	12/06/12	LT	n/a	n/a	GSS232

The QC reported here applies to the following samples:

CAS No.	Compound	TC20890-1 ug/l Q	Spike ug/l	MS ug/l	MS %	Limits
74-82-8	Methane	20100 b	21.5	17100	-13815	* <del>6</del> 8-139
74-85-1	Ethene	1.0 U	57.4	5540	9654*	52-145
74-84-0	Ethane	3500 b	43.3	4120	1431*	a 68-131
74-98-6	Propane	66.8	60.6	172	174*	69-131
75-28-5	Isobutane	8.41	72.5	93.3	117	72-131
106-97-8	Butane	10.3	76.6	101	119	66-128

⁽a) Outside control limits due to high level in sample relative to spike amount.



⁽b) Result is from Run #2.

^{* =} Outside of Control Limits.

Method: RSKSOP-147/175

## **Duplicate Summary Job Number:** TC20872

PESTXST EarthCon Consultants Account:

**Project:** Quarterly Well Sampling, Parker County, Texas

Sample TC20890-1DUP TC20890-1	File ID SS005028.D SS005027.D	_	<b>Analyzed</b> 12/06/12 12/06/12	By LT LT	Prep Date n/a n/a	Prep Batch n/a n/a	Analytical Batch GSS232 GSS232
TC20890-1	SS005030.D	250	12/06/12	LT	n/a	n/a	GSS232

The QC reported here applies to the following samples:

TC20872-1

CAS No.	Compound	TC20890-1 ug/l Q	DUP ug/l	Q	RPD	Limits
74-82-8	Methane	20100 a	16400	E	21	53
74-85-1	Ethene	1.0 U	ND		nc	27
74-84-0	Ethane	3500 a	4020	E	14	43
74-98-6	Propane	66.8	99.1		39*	21
75-28-5	Isobutane	8.41	12.1		36*	35
106-97-8	Butane	10.3	15.1		38*	33

(a) Result is from Run #2.



^{* =} Outside of Control Limits.



### ANALYSIS REPORT

Lab #: 321078 Job #: 20030

Sample Name/Number: WW1-Wel-113012
Company: Oil Tracers, LLC

Date Sampled: 11/30/2012

Container: Dissolved Gas Bottle

Field/Site Name: Third Quarter Well Sampling

Location: Parker County, Texas

Formation/Depth:

Sampling Point:

Date Received: 12/05/2012 Date Reported: 2/01/2013

Component	Chemical mol. %	δ ¹³ C ‰	δD ‰	δ ¹⁸ Ο ‰
Carbon Monoxide	nd			
Hydrogen Sulfide	na			
Helium	na			
Hydrogen	nd			
Argon	1.44			
Oxygen	0.15			
Nitrogen	75.39			
Carbon Dioxide	0.33			
Methane	21.99	-46.36	-179.5	
Ethane	0.701	-21.9		
Ethylene	nd			
Propane	nd			
Propylene	nd			
Iso-butane	nd			
N-butane	0.0013			
Iso-pentane	nd			
N-pentane	nd			
Hexanes +	nd			

#### Remarks:

Analysis is of gas extracted from water by headspace equilibration. Analysis has been corrected for helium added to create headspace. Helium dilution factor = 0.77

nd = not detected. na = not analyzed. Isotopic composition of hydrogen is relative to VSMOW. Isotopic composition of carbon is relative to VPDB. Isotopic composition of oxygen is relative to VSMOW, except for carbon dioxide which is relative to VPDB. Calculations for BTU and specific gravity per ASTM D3588. Chemical compositions are normalized to 100%. Mol. % is approximately equal to vol. %.

^{*}Addition of helium negates the ability to detect native helium and may negate the ability to detect hydrogen.

^{**} Ethane isotopes obtained online via GC-C-IRMS



12/12/12



### Technical Report for

EarthCon Consultants

Quarterly Well Sampling, Parker County, Texas

3rd Quarter / WW19-Wil

Accutest Job Number: TC20877

Sampling Date: 12/01/12

### Report to:

EarthCon Consultants 4800 Sugar Grove Suite 420 Stafford, TX 77477

gfloreslovo@earthcon.com; djackson@jacksonsjoberg.com; mcpatton@rangeresources.com; escott@earthcon.com

ATTN: Gabriela Floreslovo

Total number of pages in report: 26



Test results contained within this data package meet the requirements of the National Environmental Laboratory Accreditation Conference and/or state specific certification programs as applicable.

Client Service contact: Elessa Sommers 713-271-4700

Laboratory Director

Certifications: TX (T104704220-12-8) AR (11-028-0) AZ (AZ0769) FL (E87628) KS (E-10366) LA (85695/04004) OK (211-035)

This report shall not be reproduced, except in its entirety, without the written approval of Accutest Laboratories. Test results relate only to samples analyzed.



### **Sections:**

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## **Sample Summary**

EarthCon Consultants

Job No:

TC20877

Quarterly Well Sampling, Parker County, Texas Project No: 3rd Quarter / WW19-Wil

Sample	Collected			Matr	<del></del>	Client
Number	Date	Time By	Received	Code	Туре	Sample ID
TC20877-1	12/01/12	14:05	12/04/12	AQ	Ground Water	WW19-WIL-120112





#### SAMPLE DELIVERY GROUP CASE NARRATIVE

Client: EarthCon Consultants Job No TC20877

Site: Quarterly Well Sampling, Parker County, Texas Report Date 12/12/2012 10:29:44 A

1 Sample was collected on 12/01/2012 and received intact at Accutest on 12/04/2012 and properly preserved in 1 cooler at 2.4 Deg C. The sample received an Accutest job number of TC20877. A listing of the Laboratory Sample ID, Client Sample ID and date of collection are presented in the Results Summary Section of this report.

Except as noted below, all method specified calibrations and quality control performance criteria were met for this job. For more information, please refer to QC summary pages.

#### Volatiles by GCMS By Method SW846 8260B

Matrix AQ Batch ID: VX1673

- All samples were analyzed within the recommended method holding time.
- All method blanks for this batch meet method specific criteria.
- Sample(s) TC20864-1MS, TC20864-1MSD were used as the QC samples indicated.

#### Volatiles by GC By Method RSKSOP-147/175

Matrix AQ Batch ID: GSS233

- All samples were analyzed within the recommended method holding time.
- All method blanks for this batch meet method specific criteria.
- Sample(s) TC20879-1DUP, TC20970-2MS were used as the QC samples indicated.
- Matrix Spike Recovery for Methane is outside control limits. Outside control limits due to high level in sample relative to spike
- TC20970-2MS: Sample was not preserved to a pH < 2.

Accutest Laboratories Gulf Coast (ALGC) certifies that this report meets the project requirements for analytical data produced for the samples as received at ALGC and as stated on the COC. ALGC certifies that the data meets the Data QualityObjectives for precision, accuracy and completeness as specified in the ALGC Quality Manual except as noted above. This report is to be used in its entirety. ALGC is not responsible for any assumptions of data quality if partial data packages are used



# **Summary of Hits Job Number:** TC20877

Account: EarthCon Consultants

Quarterly Well Sampling, Parker County, Texas 12/01/12**Project:** 

Collected:

Lab Sample ID Analyte	Client Sample ID	Result/ Qual	MQL	SDL	Units	Method
TC20877-1	WW19-WIL-1201	12				
Methane Ethane		3.54 0.439	0.050 0.0010	0.030 0.00050	mg/l mg/l	RSKSOP-147/175 RSKSOP-147/175





Sample Results		
Report of Analysis		



### 4

## **Report of Analysis**

Client Sample ID: WW19-WIL-120112

 Lab Sample ID:
 TC20877-1
 Date Sampled:
 12/01/12

 Matrix:
 AQ - Ground Water
 Date Received:
 12/04/12

 Method:
 SW846 8260B
 Percent Solids:
 n/a

**Project:** Quarterly Well Sampling, Parker County, Texas

	File ID	DF	Analyzed	By	<b>Prep Date</b>	Prep Batch	Analytical Batch
Run #1	X0087074.D	1	12/06/12	CF	n/a	n/a	VX1673
Run #2							

	Purge Volume	
Run #1	5.0 ml	
Run #2		

#### **Purgeable Aromatics**

CAS No.	Compound	Result	MQL	SDL	Units	Q
71-43-2 108-88-3 100-41-4 1330-20-7	Benzene Toluene Ethylbenzene Xylene (total)	0.00034 U 0.00033 U 0.00032 U 0.00087 U	0.0010 0.0010 0.0010 0.0030	0.00034 0.00033 0.00032 0.00087	mg/l mg/l mg/l mg/l	
CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits		
1868-53-7 17060-07-0 2037-26-5 460-00-4	Dibromofluoromethane 1,2-Dichloroethane-D4 Toluene-D8 4-Bromofluorobenzene	106% 97% 98% 98%		72-122% 68-124% 80-119% 72-126%		

 $\begin{array}{ll} U = & Not \; detected & SDL \; - \; Sample \; Detection \; Limit \\ MQL = & Method \; Quantitation \; Limit \\ \end{array}$ 

E = Indicates value exceeds calibration range

J = Indicates an estimated value

B = Indicates analyte found in associated method blank N = Indicates presumptive evidence of a compound



### 4

## **Report of Analysis**

Client Sample ID: WW19-WIL-120112

 Lab Sample ID:
 TC20877-1
 Date Sampled:
 12/01/12

 Matrix:
 AQ - Ground Water
 Date Received:
 12/04/12

 Method:
 RSKSOP-147/175
 Percent Solids:
 n/a

**Project:** Quarterly Well Sampling, Parker County, Texas

	File ID	DF	Analyzed	By	<b>Prep Date</b>	Prep Batch	<b>Analytical Batch</b>
Run #1	SS005057.D	1	12/07/12	LT	n/a	n/a	GSS233
Run #2	SS005058.D	100	12/07/12	LT	n/a	n/a	GSS233

#### **RSK147 Special List**

CAS No.	Compound	Result	MQL	SDL	Units	Q
74-82-8	Methane	3.54 a	0.050	0.030	mg/l	
74-85-1	Ethene	0.00050 U	0.0010	0.00050	mg/l	
74-84-0	Ethane	0.439	0.0010	0.00050	mg/l	
74-98-6	Propane	0.00075 U	0.0015	0.00075	mg/l	
75-28-5	Isobutane	0.00075 U	0.0015	0.00075	mg/l	
106-97-8	Butane	0.00075 U	0.0015	0.00075	mg/l	

(a) Result is from Run# 2

U = Not detected

SDL - Sample Detection Limit

MQL = Method Quantitation Limit

E = Indicates value exceeds calibration range

J = Indicates an estimated value

B = Indicates analyte found in associated method blank N = Indicates presumptive evidence of a compound





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N	lisc.	Forms

Custody Documents and Other Forms

Includes the following where applicable:

- Chain of Custody
- LRC Form



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TC20877: Chain of Custody Page 1 of 4







### **Accutest Laboratories Sample Receipt Summary**

Accutest Job Number: TC20877 Client: EARTH			EARTHCON CONSULTANTS			Project: 3RD QTR WELL SAMPLING, PARKER COUNTY, T				
Date / Time Received: 12/4/2	:012		Delivery Metho	od:	Client	Airbill #'s:				
No. Coolers: 1	Therm ID:	IR6				Temp Adjus	tment Factor:	0.2		
Cooler Temps (Initial/Adjusted	<b>d):</b> #1: (2.2/	/2.4)								
Cooler Security Y	or N		<u>Y</u>	or N	Sample Integri	ty - Docume	ntation	<u>Y</u>	or N	<u>N_</u>
1. Custody Seals Present:		3. COC Pr			Sample labels	present on bo	ttles:	<b>✓</b>		
2. Custody Seals Intact:	<u> </u>	Smpl Dates	s/Time OK 🗸		Container labe	eling complete:		<b>✓</b>	J	
Cooler Temperature	Y or N	<u>L</u>			3. Sample conta	iner label / CO	C agree:	✓	1	
1. Temp criteria achieved:	<b>V</b>				Sample Integr	itv - Conditio	on	<u>Y</u>	or N	<u>N_</u>
Cooler temp verification:	Infared G	iun			Sample recvd		<u>—</u>	<b>✓</b>	1	
3. Cooler media:	Ice (bag	3)			2. All containers			<b>✓</b>	1	П
Quality Control Preservation	Y or N	N N/A	WTE	STB	3. Condition of s	ample:			Intact	
1. Trip Blank present / cooler:	<b>V</b>		$\checkmark$		Sample Integr	ity - Instructi	ons	Υ	or N	I N/A
2. Trip Blank listed on COC:					1. Analysis requ			<u> </u>		<u>_</u>
3. Samples preserved properly:	<b>V</b>				2. Bottles receiv	ed for unspeci	fied tests		<u> </u>	_
4. VOCs headspace free:	<b>v</b>				3. Sufficient vol	ume recvd for a	analysis:	<b>✓</b>		]
					4. Compositing	instructions cle	ear:			✓
					5. Filtering instr	uctions clear:				
Comments - Received trip blank	not listed on	COC.			•					

TC20877: Chain of Custody Page 2 of 4

Page 1 of 3







#### **Problem Resolution**

Accutest Job Number: TC20877

**CSR:** Elessa Sommers Response Date: 12/5/2012

Response: Trip blank is on separate report.

TC20877: Chain of Custody Page 3 of 4









### Sample Receipt Log

 Job #:
 TC20877
 Date / Time Received:
 12/4/2012 9:22:00 AM
 Initials:
 CH

Client: EARTHCON CONSULTANTS

Cooler #	Sample ID:	Vol	Bot #	Location	Pres	pH	Therm ID	Initial Temp	Therm CF	Corrected Temp
1	TC20877-1	40ml	1	VR	HCL	Note #1 - Preservative to be checked by analyst at the instrument.	IR6	2.2	0.2	2.4
1	TC20877-1	40ml	2	VR	HCL	Note #1 - Preservative to be checked by analyst at the instrument.	IR6	2.2	0.2	2.4
1	TC20877-1	40ml	3	VR	HCL	Note #1 - Preservative to be checked by analyst at the instrument.	IR6	2.2	0.2	2.4
1	TC20877-1	40ml	4	VR	HCL	Note #1 - Preservative to be checked by analyst at the instrument.	IR6	2.2	0.2	2.4
1	TC20877-1	40ml	5	VR	HCL	Note #1 - Preservative to be checked by analyst at the instrument.	IR6	2.2	0.2	2.4
1	TC20877-1	40ml	6	VR	HCL	Note #1 - Preservative to be checked by analyst at the instrument.	IR6	2.2	0.2	2.4

TC20877: Chain of Custody

Page 4 of 4



#### Laboratory Data Package Cover Page Appendix A

This signature page, the laboratory review checklist, and the following reportable data:

TC20877 This data package consists of

[]

QA Manager Name (Printed)

Richard Rodriguez

Signature

į.	R1	Field chain-of-custody documentation	J;
	R2	Sample identification cross-reference	
D	R3	Test reports (analytical data sheets) for	or each environmental sample that includes:
		a)	Items consistent with NELAC 5.13 or ISO/IEC 17025 Section 5.10
		b)	dilution factors,
		c)	preparation methods,
		d)	cleanup methods, and
		e)	if required for the project, tentatively identified compounds (TICs).
	R4	Surrogate recovery data including:	
		a)	Calculated recovery (%R), and
		b)	The laboratory's surrogate QC limits.
	R5	Test reports/summary forms for blank	samples;
	R6	Test reports/summary forms for labor	atory control samples (LCSs) including:
		a)	LCS spiking amounts,
		b)	Calculated %R for each analyte, and
		c)	The laboratory's LCS QC limits.
Ģ	R7	Test reports for project matrix spike/m	natrix spike duplicates (MS/MSDs) including:
		a)	Samples associated with the MS/MSD clearly identified,
		b)	MS/MSD spiking amounts,
		c)	Concentration of each MS/MSD analyte measured in the parent and
		d)	Calculated %Rs and relative percent differences (RPDs), and
		e)	The laboratory's MS/MSD QC limits
	R8	Laboratory analytical duplicate (if app	licable) recovery and precision:
		a)	The amount of analyte measured in the duplicate,
		b)	The calculated RPD, and
		c)	The laboratory's QC limits for analytical duplicates.
	R9	List of method quantitation limits (MQ	Ls) and detectability check sample results for each analyte for each
Ģ	R10	Other problems or anomalies.	
		, ,	item in Laboratory Review Checklist and for each analyte, matrix, and
metnoa to	r wnich the i	laboratory does not hold NELAC accre	ditation under the Texas Laboratory Accreditation Program.
Texas Lab the Excep requirement affirm to the the data, he withheld.	poratory Acc tion Report. ents of the mane best of managery mave been id	reditation Program for all the methods, This data package has been reviewed ethods used, except where noted by th y knowledge, all problems/anomalies, of lentified by the laboratory in the Labora	laboratory data package. This laboratory is NELAC accredited under the analytes, and matrices reported in this data package except as noted in by the laboratory and is complete and technically compliant with the le laboratory in the attached exception reports. By my signature below, I observed by the laboratory as having the potential to affect the quality of atory Review Checklist, and no information or data have been knowingly
	applicable:		nder 30 TAC&25.6 and was last inspection by
[]		noted in the Exception Reports herein	011. Any findings affecting the data in this laboratory data package are n. The official signing the cover page of the report in which these data are data package and is by signature affirming the above release statement

Official Title (printed)

Laboratory Director

Date 12/12/2012



	L	ABORATORY REVIEW CHECKLIST: REPORTABLE	DAT	Ά					
Laboratory	/ Name:	Accutest Gulf Coast LRC Date:	12/	/12/2	012				
		Quarterly Well Sampling, Parker	l						
Project Na		County, Texas Laboratory Project Number:	+	2087					
Reviewer	Name:	Anita Patel Prep Batch Number(s):	GSS233, VX1673 YES NO NA NR ER #						
#1	A ²	DESCRIPTION	YES	NO	NA°	NR ⁻	ER#		
R1	OI	CHAIN-OF-CUSTODY (C-O-C):							
		Did samples meet the laboratory's standard conditions of sample acceptability upon receipt?	Х						
		Were all departures from standard conditions described in an exception report?	X						
R2	OI	Sample and quality control (QC) identification							
1\2	Oi	Are all field sample ID numbers cross-referenced to the laboratory ID numbers?	X						
		Are all laboratory ID numbers cross-referenced to the corresponding QC data?	l x						
R3	OI	Test reports	<u> </u>	_					
- 13	UI.	Were samples prepared and analyzed within holding times?	X						
		Other than those results <mql, all="" bracketed="" by="" calibration<="" other="" raw="" td="" values="" were=""><td></td><td></td><td></td><td></td><td></td></mql,>							
		standards?	X						
	Were calculations checked by a peer or supervisor?								
		Were all analyte identifications checked by a peer or supervisor?	X						
		X							
		Were sample detection limits reported for all analytes not detected?  Were all results for soil and sediment samples reported on a dry weight basis?	† · ·		Х				
				Х					
		Were % moisture (or solids) reported for all soil and sediment samples?  Were bulk soils/solids samples for volatile analysis extracted with methanol per			Х				
		If required for the project, are TIC's reported?			Χ				
R4	0	Surrogate recovery data  Were surrogates added prior to extraction?							
		X							
		Were surrogate percent recoveries in all samples within the laboratory QC limits?	X						
R5	OI	Test reports/summary forms for blank samples							
		Were appropriate type(s) of blanks analyzed?	X				<u> </u>		
		Were blanks analyzed at the appropriate frequency?  Were method blanks taken through the entire analytical process, including	X						
		preparation and, if applicable, cleanup procedures?	X						
		Were blank concentrations <mql?< td=""><td>X</td><td></td><td></td><td></td><td></td></mql?<>	X						
R6	OI	Laboratory control samples (LCS):	- A						
		Were all COCs included in the LCS?	Х						
		Was each LCS taken through the entire analytical procedure, including prep and							
		cleanup steps?	X						
		Were LCSs analyzed at required frequency?	Х						
		Were LCS (and LCSD, if applicable) %Rs within the laboratory QC limits?	Х						
		Does the detectablility check sample data document the laboratory's capability to	X				5		
		detect the COCs at the MDL used to calculate the SDLs?	^				3		
		Was the LCSD RPD within QC limits?			Χ				
R7	OI	Matrix spike (MS) and matrix spike duplicate (MSD) data							
		Were the project/method specified analytes included in the MS and MSD?	X						
		Were MS/MSD analyzed at the appropriate frequency?	X	L.					
		Were MS (and MSD, if applicable) %Rs within the laboratory QC Limits?		Х			4		
	<del> </del>	Were the MS/MSD RPDs within laboratory QC limits?	X						
R8	OI	Analytical duplicate data	V						
		Were appropriate analytical duplicates analyzed for each matrix?	X				<u> </u>		
		Were analytical duplicates analyzed at the appropriate frequency?	X				<del></del>		
R9	- 01	Were RPDs or relative standard deviations within the laboratory QC limits?  Method quantitation limits (MQLs):	X	_					
K9	OI	Are the MQLs for each method analyte included in the laboratory data package?	V						
		Do the MQLs correspond to the concentration of the lowest non-zero calibration	X	$\vdash$					
		Are unadjusted MQLs and DCSs included in the laboratory data package?	+^	Х			2		
R10	OI	Other problems/anomalies		_^_					
	<del>  "</del>	Are all known problems/anomalies/special conditions noted in this LRC and ER?	X						
		Was applicable and available technology used to lower the SDL to minimize the	X						
		Is the laboratory NELAC-accredited under the Texas Laboratory Accreditation	†^						
		Program for the analytes, matrices, and methods associated with this laboratory	X				3		
		data package?	''				-		
·		<u> </u>	-						



Laboratory Name: Accutest Gulf Coast   LRC Date: TC20877   Project Name: Quarterly Well Sampling, Parker   Laboratory Project Number: TC20877   Reviewer Name: Anita Patel   Prep Batch Number(s): GSS233, VX1673   #								
							:73	
			Trop Bater (4umber(3).					ED#
				ILO	IVO	INA	INIX	LIX#
31	01		response factors for each analyte within OC					
		·	e response factors for each analyte within QC	X				
			officient criteria met?					
		·		_				
				^				
			ne lowest and highest standard used to	X				
				.,				
				X				
			verified using an appropriate second source	l x l				
S2	OI							
			-					
				Х				
			$\Box$		X			
S3	0							
		Was the appropriate compound for the	ne method used for tuning?	Х				
		Were ion abundance data within the	method-required QC limits?	Х				
S4	S4 O Internal standards (IS)  Were IS area counts and retention times within the method-required QC limits?							
S5	OI	Raw data (NELAC Section 5.5.10)						
		Were the raw data (for example, chro	matograms, spectral data) reviewed by an	х				
		analyst?		^				
		Were data associated with manual in	tegrations flagged on the raw data?	Х				
S6	0	Dual column confirmation						
		Did dual column confirmation results	meet the method-required QC?			Х		
S7	0	Tentatively identified compounds	(TICs):					
			s spectra and TIC data subject to appropriate					
		checks?	, , , , , ,			Х		
S8	1	Interference Check Sample (ICS) r	esults					
		Were percent recoveries within method			Х			
S9			kes, and method of standard additions					
			, and the linearity within the QC limits					
		specified in the method?	,			Х		
S10	OI	Method detection limit (MDL) studi	es					
	<u> </u>	Was a MDL study performed for each		Х				
		Is the MDL either adjusted or support	, ,	X				5
S11	OI	Proficiency test reports		_^				
	<u> </u>		ceptable on the applicable proficiency tests or					
		evaluation studies?	ceptable on the applicable proficiency tests of	X				
S12	OI	Standards documentation						
312	- Oi		s NIST-traceable or obtained from other					
		appropriate source?	3 NIO 1-li aceable oi obtained ironi other	X				
642	OI	Compound/analyte identification p	randuran		_			
S13	UI.			ΧI		l e	1	
644		Are the procedures for compound/and	•	^				
S14	OI	Demonstration of analyst compete	, ,	V 1				
		Was DOC conducted consistent with		X		<u> </u>		
		Is documentation of the analyst's com		Х				
S15	OI		ion for methods (NELAC Chapter 5)					
			the data documentated, verified, and	l x l		1		
		validated, where applicable?						
S16	OI	Laboratory standard operating pro						
		Are laboratory SOPs current and on f	ile for each method performed?	X				



	LABOF	RATORY REVIEW CHEC	KLIST (continued): Exception	n Reports				
Laboratory	Name:	Accutest Gulf Coast	LRC Date:	12/12/2012				
Project Na	me:	Quarterly Well Sampling, Parker	Laboratory Project Number:	TC20877				
Reviewer	Name:	Anita Patel	Prep Batch Number(s):	GSS233, VX1673				
ER# ¹	Description	on						
1	blank. The	SDL is defined in the report as the MI		'				
2	For reporti included in	ents the unadjusted MQL. The DCS is on file i	n the laboratory and is not					
3	The laboratory is NELAC-accredited under the Texas Laboratory Accreditation Program for the analyt methods associated with this laboratory data package for analytes that are listed in the Texas Fields of the Texas Fields of the Texas Fields of the Texas Fields of the Texas Fields of the Texas Fields of the Texas Fields of the Texas Fields of the Texas Fields of the Texas Fields of the Texas Fields of the Texas Fields of the Texas Fields of the Texas Fields of the Texas Fields of the Texas Fields of the Texas Fields of the Texas Fields of the Texas Fields of the Texas Fields of the Texas Fields of the Texas Fields of the Texas Fields of the Texas Fields of the Texas Fields of the Texas Fields of the Texas Fields of the Texas Fields of the Texas Fields of the Texas Fields of the Texas Fields of the Texas Fields of the Texas Fields of the Texas Fields of the Texas Fields of the Texas Fields of the Texas Fields of the Texas Fields of the Texas Fields of the Texas Fields of the Texas Fields of the Texas Fields of the Texas Fields of the Texas Fields of the Texas Fields of the Texas Fields of the Texas Fields of the Texas Fields of the Texas Fields of the Texas Fields of the Texas Fields of the Texas Fields of the Texas Fields of the Texas Fields of the Texas Fields of the Texas Fields of the Texas Fields of the Texas Fields of the Texas Fields of the Texas Fields of the Texas Fields of the Texas Fields of the Texas Fields of the Texas Fields of the Texas Fields of the Texas Fields of the Texas Fields of the Texas Fields of the Texas Fields of the Texas Fields of the Texas Fields of the Texas Fields of the Texas Fields of the Texas Fields of the Texas Fields of the Texas Fields of the Texas Fields of the Texas Fields of the Texas Fields of the Texas Fields of the Texas Fields of the Texas Fields of the Texas Fields of the Texas Fields of the Texas Fields of the Texas Fields of the Texas Fields of the Texas Fields of the Texas Fields of the Texas Fields of the Texas Fields of the Texas Fields of the Texas Fields of th							
4	All anomal	ies are discussed in the case narrative	ı.					
5		tory does not perform DCS analysis for e values in the Texas TRRP PCL table	or Method RSKSOP-147/175. The component es.	s reported are not listed or				

¹ER# = Exception Report identification number (an Exception Report should be completed for an item if "NR" or "No" is checked on



## GC/MS Volatiles

QC Data Summaries

Includes the following where applicable:

- Method Blank Summaries
- Blank Spike Summaries
- Matrix Spike and Duplicate Summaries



**Method:** SW846 8260B

# Method Blank Summary Job Number: TC20877

PESTXST EarthCon Consultants **Account:** 

Quarterly Well Sampling, Parker County, Texas **Project:** 

Sample VX1673-MB	<b>File ID</b> X0087062. D	<b>DF</b>	<b>Analyzed</b> 12/06/12	By CF	<b>Prep Date</b> n/a	Prep Batch n/a	Analytical Batch VX1673

The QC reported here applies to the following samples:

CAS No.	Compound	Result	RL	MDL	Units Q
71-43-2	Benzene	ND	1.0	0.34	ug/l
100-41-4	Ethylbenzene	ND	1.0	0.32	ug/l
108-88-3	Toluene	ND	1.0	0.33	ug/l
1330-20-7	Xylene (total)	ND	3.0	0.87	ug/l

CAS No.	<b>Surrogate Recoveries</b>		Limits
1868-53-7	Dibromofluoromethane	105%	72-122%
17060-07-0	1,2-Dichloroethane-D4	95%	68-124%
2037-26-5	Toluene-D8	99%	80-119%
460-00-4	4-Bromofluorobenzene	98%	72-126%



**Method:** SW846 8260B

## Blank Spike Summary Job Number: TC20877

Account: PESTXST EarthCon Consultants

Quarterly Well Sampling, Parker County, Texas **Project:** 

Sample	File ID	DF	Analyzed	By	<b>Prep Date</b>	Prep Batch	<b>Analytical Batch</b>
VX1673-BS	X0087060.D	1	12/06/12	CF	n/a	n/a	VX1673

The QC reported here applies to the following samples:

CAS No.	Compound	Spike ug/l	BSP ug/l	BSP %	Limits
71-43-2	Benzene	25	22.2	89	68-119
100-41-4	Ethylbenzene	25	22.1	88	71-117
108-88-3	Toluene	25	22.4	90	73-119
1330-20-7	Xylene (total)	75	67.7	90	74-119

CAS No.	<b>Surrogate Recoveries</b>	BSP	Limits
1868-53-7	Dibromofluoromethane	101%	72-122%
17060-07-0	1,2-Dichloroethane-D4	99%	68-124%
2037-26-5	Toluene-D8	101%	80-119%
460-00-4	4-Bromofluorobenzene	92%	72-126%



^{* =} Outside of Control Limits.

## 6.3.1

Page 1 of 1

**Method:** SW846 8260B

## Matrix Spike/Matrix Spike Duplicate Summary

Job Number: TC20877

**Account:** PESTXST EarthCon Consultants

**Project:** Quarterly Well Sampling, Parker County, Texas

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
TC20864-1MS	X0087064.D	1	12/06/12	CF	n/a	n/a	VX1673
TC20864-1MSD	X0087065.D	1	12/06/12	CF	n/a	n/a	VX1673
TC20864-1	X0087063.D	1	12/06/12	CF	n/a	n/a	VX1673

The QC reported here applies to the following samples:

CAS No.	Compound	TC20864-1 ug/l Q	Spike ug/l	MS ug/l	MS %	MSD ug/l	MSD %	RPD	Limits Rec/RPD
71-43-2	Benzene	1.0 U	25	23.0	92	22.4	90	3	68-119/12
100-41-4	Ethylbenzene	1.0 U	25	22.7	91	22.4	90	1	71-117/12
108-88-3	Toluene	1.0 U	25	22.9	92	22.5	90	2	73-119/13
1330-20-7	Xylene (total)	3.0 U	75	69.8	93	68.4	91	2	74-119/13

CAS No.	<b>Surrogate Recoveries</b>	MS	MSD	TC20864-1	Limits
1868-53-7	Dibromofluoromethane	103%	101%	105%	72-122%
17060-07-0	1,2-Dichloroethane-D4	98%	98%	96%	68-124%
2037-26-5	Toluene-D8	100%	100%	100%	80-119%
460-00-4	4-Bromofluorobenzene	91%	92%	98%	72-126%



^{* =} Outside of Control Limits.



## GC Volatiles

QC Data Summaries

Includes the following where applicable:

- Method Blank Summaries
- Blank Spike Summaries
- Matrix Spike and Duplicate Summaries



Method: RSKSOP-147/175

# Method Blank Summary Job Number: TC20877

Job Number:

PESTXST EarthCon Consultants **Account:** 

**Project:** Quarterly Well Sampling, Parker County, Texas

Sample GSS233-MB	<b>File ID</b> SS005056.D	<b>DF</b> 1	<b>Analyzed</b> 12/07/12	By LT	<b>Prep Date</b> n/a	<b>Prep Batch</b> n/a	Analytical Batch GSS233

The QC reported here applies to the following samples:

CAS No.	Compound	Result	RL	MDL	Units Q
74-82-8	Methane	ND	0.50	0.30	ug/l
74-85-1	Ethene	ND	1.0	0.50	ug/l
74-84-0	Ethane	ND	1.0	0.50	ug/l
74-98-6	Propane	ND	1.5	0.75	ug/l
75-28-5	Isobutane	ND	1.5	0.75	ug/l
106-97-8	Butane	ND	1.5	0.75	ug/l



Method: RSKSOP-147/175

## Blank Spike Summary Job Number: TC20877

Account: PESTXST EarthCon Consultants

Quarterly Well Sampling, Parker County, Texas **Project:** 

Sample GSS233-BS	<b>File ID</b> SS005054.D	<b>DF</b> 1	<b>Analyzed</b> 12/07/12	By LT	<b>Prep Date</b> n/a	<b>Prep Batch</b> n/a	Analytical Batch GSS233

The QC reported here applies to the following samples:

CAS No.	Compound	Spike ug/l	BSP ug/l	BSP %	Limits
74-82-8	Methane	21.5	16.2	75	68-139
74-85-1	Ethene	57.4	43.2	75	52-145
74-84-0	Ethane	43.3	47.1	109	68-131
74-98-6	Propane	60.6	60.5	100	69-131
75-28-5	Isobutane	72.5	70.4	97	72-131
106-97-8	Butane	76.6	73.6	96	66-128



^{* =} Outside of Control Limits.

Method: RSKSOP-147/175

## **Matrix Spike Summary**

Job Number: TC20877

PESTXST EarthCon Consultants Account:

Project: Quarterly Well Sampling, Parker County, Texas

Sample TC20970-2MS ^a TC20970-2 ^a	File ID SS005067.D SS005066.D	Analyzed 12/07/12 12/07/12	By LT LT	Prep Date n/a n/a	Prep Batch n/a n/a	Analytical Batch GSS233 GSS233

The QC reported here applies to the following samples:

CAS No.	Compound	TC20970-2 ug/l Q	Spike ug/l	MS ug/l	MS %	Limits
74-82-8	Methane	105	21.5	95.8	-42* b	68-139
74-85-1	Ethene	ND	57.4	46.6	81	52-145
74-84-0	Ethane	4.71	43.3	46.7	97	68-131
74-98-6	Propane	ND	60.6	53.4	88	69-131
75-28-5	Isobutane	ND	72.5	61.8	85	72-131
106-97-8	Butane	ND	76.6	66.0	86	66-128

⁽a) Sample was not preserved to a pH < 2.



⁽b) Outside control limits due to high level in sample relative to spike amount.

^{* =} Outside of Control Limits.

Method: RSKSOP-147/175

# **Duplicate Summary Job Number:** TC20877

Account: PESTXST EarthCon Consultants

**Project:** Quarterly Well Sampling, Parker County, Texas

TC20879-1DUP SS005062.D 1 12/07/12 LT n/a n/a GSS233 TC20879-1 SS005061.D 1 12/07/12 LT n/a n/a GSS233
--------------------------------------------------------------------------------------------------------

The QC reported here applies to the following samples:

CAS No.	Compound	TC20879-1 ug/l Q	DUP ug/l Q	RPD	Limits
74-82-8	Methane	4.10	3.34	20	53
74-85-1	Ethene	1.0 U	ND	nc	27
74-84-0	Ethane	1.0 U	ND	nc	43
74-98-6	Propane	1.5 U	ND	nc	21
75-28-5	Isobutane	1.5 U	ND	nc	35
106-97-8	Butane	1.5 U	ND	nc	33



^{* =} Outside of Control Limits.



### ANALYSIS REPORT

Lab #: 321085 Job #: 20030

Sample Name/Number: WW19-Wil-120112
Company: Oil Tracers, LLC
Date Sampled: 12/01/2012

Container: Dissolved Gas Bottle

Field/Site Name: Third Quarter Well Sampling

Location: Parker County, Texas

Formation/Depth:

Sampling Point:

Date Received: 12/05/2012 Date Reported: 2/01/2013

Component	Chemical mol. %	δ ¹³ C ‰	δD ‰	δ ¹⁸ Ο ‰
Carbon Monoxide	nd			
Hydrogen Sulfide	na			
Helium	na			
Hydrogen	nd			
Argon	1.21			
Oxygen	0.10			
Nitrogen	64.28			
Carbon Dioxide	0.21			
Methane	33.17	-43.95	-155.6	
Ethane	1.03	-22.35		
Ethylene	nd			
Propane	0.0007			
Propylene	nd			
Iso-butane	nd			
N-butane	0.0007			
Iso-pentane	0.0007			
N-pentane	nd			
Hexanes +	nd			

#### Remarks:

Analysis is of gas extracted from water by headspace equilibration. Analysis has been corrected for helium added to create headspace. Helium dilution factor = 0.72

nd = not detected. na = not analyzed. Isotopic composition of hydrogen is relative to VSMOW. Isotopic composition of carbon is relative to VPDB. Isotopic composition of oxygen is relative to VSMOW, except for carbon dioxide which is relative to VPDB. Calculations for BTU and specific gravity per ASTM D3588. Chemical compositions are normalized to 100%. Mol. % is approximately equal to vol. %.

^{*}Addition of helium negates the ability to detect native helium and may negate the ability to detect hydrogen.